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Fires in Mines, and the Means of Extinguishing Them.

BY R. P. ROTHWELL, ENGINEER.

WHEN it is found impossible to extinguish a fire in the mines by walling off the portion on fire, there remains no other resource than to close the pit; for even when it is decided to inundate the mine, it is always advisable to close the pit, whether the mine produce carburetted hydrogen (fire damp) or not, since by so doing we deaden, at least, the combustion, and prevent, in a great measure, the damage always caused by the high temperature produced by a rapid combustion. The shaft should, therefore, be immediately closed hermetically, provision being made for openings through which a registering thermometer can be introduced, and a bent pipe, or syphon, containing water, to show the pressure behind the stopping, made till the mine is completely filled, which can be known by the air issuing from the upcast extinguishing a lighted lamp, etc. It is almost needless to add, that great care should be taken, and no open lights allowed near the shaft when there is any possibility of fire damp existing in dangerous quantity. If the mine does not produce that gas, the immediate admission of choke damp is not so necessary, though it is always desirable as checking the spreading of the fire.

As the majority of fires occur from explosions of fire-damp, it follows that in most cases the air doors, bratticing, and other divisions necessary to guide the air current through the mine, are destroyed, it is then difficult to ascertain if the carbonic acid has gone into every part of the mine, or whether a large amount of air may not yet remain in the workings; this should be carefully considered in deciding on the means to be adopted to extinguish the fire, and also in fixing on the time for re-opening the pit. Not a few of our fatal accidents occurring from explosions were caused by reopening the mine too soon, or before the coal had time to cool down below the temperature at which it will ignite. In some cases, it may even be considered safest and most economical to fill the mine with water. This decision must be taken only after a careful consideration of the position of the fire, the amount of water needed to fill the works to the depth required, the time necessary to pump in that water, the nature of the roof and coal in the works, and the effect which a longer or shorter inundation would have on them, the facility for getting the water out, etc., etc. The inundation of a mine is always an expensive expedient, and should only be adopted as a last resort; yet there are cases where it is undoubtedly the best method to adopt. Each case requires a special study, and the method which might be the most suitable in one may not be adapted to another. The great sources of expense in inundating a mine are the damage caused by the water remaining for any length of time in the works (with certain kinds of rocks—some slates and fire clays especially) the falls of roof, causeing delay and expense, and the delay and cost of filling with and pumping out the water. And in coal subject to spontaneous combustion it not unfrequently happens that when the water has been pumped out the wetting of the "gob," or "waste," causes it to heat, and even to ignite, before the ventilation can be fully re-established. Every other means should in general be tried before inundating the mine, and the most efficient of these various means are the introduction of steam, carbonic acid (choke damp) and after damp, which is a mixture of nitrogen and carbonic acid. Steam is available at almost every mine, and is easily applied; it should be carried in pipes, and discharged as near the seat of the fire as possible, in order to prevent its condensation; it is a very efficient extinguishing agent, and from the facility with which it can be employed, it is now commencing to be much used; in many cases, a rubber hose, made especially for a steam hose, is all that is required to carry it for several hundred feet, and it will last as long as the occasion requires in most cases. The greatest disadvantage in the use of steam is its energetic action on some rocks, causing them to disintegrate and "fall;" but where the roof is such that it is not materially injured by steam, this is one of the most convenient, and it is always one of the most effective extinguishing agents we can use. Its action is limited to the expulsion of the air, and as it maintains a high temperature we are generally obliged to inject water, in order to cool the rocks sufficiently to allow the men to work, and also to prevent any possibility of re-ignition. The following example of its application will prove instructive: In 1857, at the St. Mathew mine, near St. Etienne, France, steam was injected after the mine had been on fire for eight days; this was continued for seventy hours, after which cold water was injected for three days, in order to cool the sides of the shaft, galleries, etc., previous to descending into the mine. The pit was then opened, and a current of air circulated while the men went down. After two days, however, the mine again caught fire, and it became again necessary to close the pit. Steam was then injected during twenty-four hours, and, after an intermission of eighteen hours, cold water was injected for twelve hours. The fire broke out a third time, and steam was admitted for eleven hours, then cold water, after which the men were

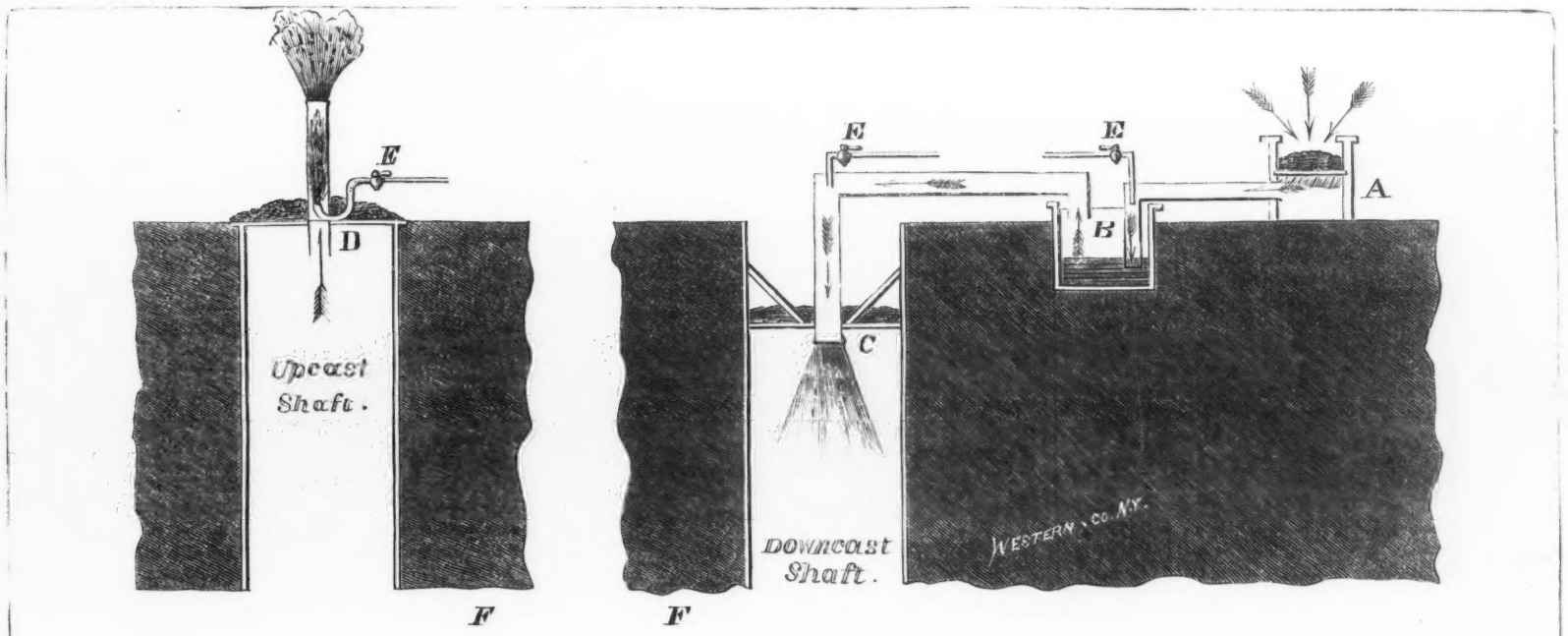

Fig. 1.—GOLDSWORTHY GURNEY'S APPARATUS FOR MANUFACTURING AFTER-DAMP—1849.

A.—Furnace. B.—Water Tank. C.—Downcast Stopping. D.—Upcast Stopping. E, E, E.—Three Steam Jets F, F.—Ga eries from Shaft to Shaft.

and prevent its becoming excessive, while at the same time it prevents the admission of fresh air.

The closing of the shaft may be effected by hanging heavy pieces of timber, by means of chains, some distance down the shaft. On the platform thus made clay is thrown, and packs itself by the force of the fall, thus rendering the stopping perfectly air-tight. The tubes above-mentioned should be inserted, and one syphon should be so arranged as to allow the water to flow down the shaft, instead of accumulating above the stopping. Where the pit is divided into a number of compartments, it becomes difficult to close it perfectly in this way. The mouth of the pit is then covered over with planks or iron doors, and clay, sand, etc., packed on this, every crevice being carefully closed. Great attention must be paid to this, more particularly in the case where it is desired to "smother out" the fire without the injection of steam or carbonic acid, otherwise a quantity of air may enter, which, though insufficient to maintain an active combustion, may yet suffice to support a slow fire, or, at least, greatly increase the time necessary for its complete extinction.

Where the mine does not produce fire damp, there is no great danger in closing the pit, but if that gas is given off in any considerable quantity, the closing of the pit is sometimes attended with great danger, there being a certain time after the closing when the quantity of atmospheric air is sufficient to make an explosive mixture with the gas from the mine. After a time, the quantity of air, or rather oxygen, is diminished by that consumed by the fire itself, and the incombustible gases produced by the combustion, mixing with the fire and fire damp, soon render the compound inexplosive. In such mines it is highly desirable to inject steam alone, or, better, steam and carbonic acid, into the downcast from the earliest practicable moment, so as thereby to diminish, as far as possible, the chance of explosion during the operation of closing, and it should continue to be injected after the stopping is

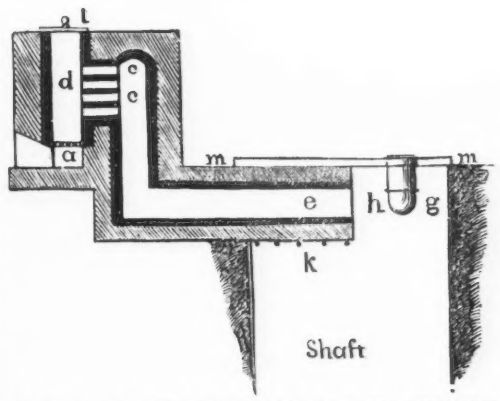

Fig. 2.—LETORET'S FURNACE FOR MANUFACTURING AFTER-DAMP.—1844.

a.—Ash-pit. *d.*—Fire-place. *c.*—Pipes carrying off the flame. *e.*—Pipe carrying gas into the Pit, *f.* *g.*—Pipe admitting water. *k.*—Iron bars supporting *e.* *m.*—Iron flooring covered with soil.

enabled to enter, and extinguished the fire completely by throwing water on it. I believe the same process was employed at the Yellow Jacket and Kentuck mines, on the Comstock lode, which were on fire a few months ago.

The application of carbonic acid or choke-damp and after-damp, is more complicated than that of steam, since the materials for its manufacture are not often on hand. The most usual method of manufacturing carbonic acid is by means of chalk or limestone, or any cheap carbonate easily decomposed, treated with one of the cheaper acids—as sulphuric, nitric or hydrochloric. The gas produced in this way has the advantage of possessing a low temperature; it not only extinguishes the fire but tends to cool the rocks to a point below the temperature necessary for ignition. Portable machines, known as "fire extinguishers," are convenient means of manufacturing this gas where the quantity required is not very great, and they are to be found everywhere, at a small cost, and are always ready for use. Where the quantity of gas required is very large, as, for example, in filling a mine, one of the cheapest and most convenient methods of producing it is by the combustion of coke or charcoal in a furnace of suitable form, such as we illustrate; and, as it was the means adopted in the first application of "after damp" or carbonic acid to the extinguishing of fires in mines, we will devote some space to it, especially as the credit of the invention is commonly misapplied. The first application was made by M. Jules Letoret, in Belgium, in the year 1844. Five years later (1849) we find the same principle applied in England by Goldsworthy Gurney, who takes credit himself for the invention, and is even at the present time credited with it by nearly all the English engineers. It is scarcely possible that Mr. Gurney could have been ignorant of Mr. Letoret's invention, for we find him perfectly "posted" on the application of his steam jet in the Belgian mines, about the same time. The accompanying drawings of the furnace used in each case, and the particulars of its application are instructive, and at the same time place the credit of the invention where it justly belongs.

The 15th of February, 1844, a fire occurred from an explosion of fire damp in the No. 2 shaft, Agrappe colliery, near Mons, in Belgium; the pit was 1,171 feet deep, three veins at different levels being worked. Efforts were made to extinguish the fire by throwing water on it; but it had already made too great progress, the frequent explosions of fire damp having become very dangerous; it was then decided to reverse the ventilating current in order to prevent the fire from destroying the pumps. Mr. Jules Letoret then prepared to introduce carbonic acid into the works, that gas having—as we have already stated—the property of rendering harmless an explosive mixture of carburetted hydrogen and air, if only added to it in the proportion of one-tenth to one-seventh. Several experiments were made for the manufacture and introduction of this gas—the first on the 17th of February, 1844. The effect of the gas was to reduce the number and violence of the explosions, but the fire still continued to burn at the foot of the shaft; the pit was not perfectly closed at the time. On the 23d of February Mr. Letoret built a furnace, intended to produce carbonic acid in a continuous manner, from the combustion of coke; the shafts were closed hermetically, leaving only openings for the introduction and outlet of the products of combustion. This apparatus is shown in the accompanying figure, and is of so simple a construction as to require but little explanation. The furnace was charged with burning coke and charcoal to the depth of 17 inches, that depth being found sufficient to consume all the oxygen in the air passing through the fire, and to produce carbonic acid and nitrogen (a greater depth of fire will produce at the same time carbonic oxide); and as this gas issued from the furnace at a high temperature the reservoir of water, *h*, was inserted through the stopping, so that the gases might be cooled and prevent any chance of igniting the woodwork of the shaft. When the apparatus was set to work on the 24th of February, the fire was visible at the foot of the shaft; on the 25th the flames and explosions had ceased, the introduction of "after damp" was then stopped and fresh air was allowed to enter the mine; but on descending into the mine a large fire was discovered, quite red but with little flame. The work of clearing out the gallery leading to it was commenced, in order to be able to throw water on the fire; but the barometer indicating a diminishing atmospheric pressure, (the fear of fresh discharges of carburetted hydrogen induced the abandonment of the mine, into which carbonic acid was again introduced. On the 26th, the flame and explosions having again ceased, fresh air was re-admitted, and on entering the mine water was thrown on the fire by means of fire-engines; timbers were set, though with difficulty, on account of the high temperature, and because the rocks, decomposed by heat, disintegrated and fell when water was applied. This work was continued to the 3d of March when the fire was entirely extinguished and the rocks cooled down; the roof had fallen to the depth of 22 feet. Thus a fire which had threatened to destroy the mine, or at least to prevent its working for months or years, was completely extinguished in the course of ten days.

The above particulars taken from a "Memoire" by M. Jottrand, in the "Annales des Travaux Publiques de Belgique," though very brief, are yet sufficient to show the manner of operating in such cases, and to establish Mr. Letoret's claim of invention of this method of extinguishing fires in mines. I shall now describe Mr. Gurney's furnace and manner of operating. The full particulars are given in a Parliamentary Report on accidents in coal mines, 1849.

The accompanying drawing shows the arrangement of the apparatus; the furnace was four feet square, the ash-pit air-tight, and the pipe leading from it thirteen inches in diameter. This pipe plunged into a tank of water (B). In order to cool the gas before entering the mine the air was drawn through the fire and forced into the pit by means of three steam jets (E E E), working with a pressure of from thirty to forty pounds of steam in the boilers.

The fire which called this apparatus into use occurred in the Astley pit (390 feet deep), near Manchester, England, on the 2d April, 1849. The mine being very fiery, there were great fears of an explosion. The engineer in charge, Mr. Darlington, wrote to Mr. Gurney—well known from his application of the steam jet to mine ventilation—to know if there was any means of "drawing fire-damp out of a closed mine without letting air in." Mr. Gurney, in his evidence before the Parliamentary Committee above referred to, says: "An idea struck me (from experiments I had made in passing air through a closed vessel running through the fire, where I found the whole of the oxygen to be combined, and nothing going out but nitrogen and carbonic acid), if we made a large furnace and connected with the ash pit, perfectly air tight, a cylinder, and put a steam jet in the cylinder, we might draw air through the fire and drive nitrogen into the mine." Mr. Gurney found that passing air through a fire 18 inches deep would consume the whole of the oxygen of the air; Mr. Letoret found 17 inches sufficient. It is evidently desirable that the depth of the fire should not much exceed that necessary to effect the complete combustion of the oxygen and the formation of carbonic acid; for when it is increased a portion of the carbonic acid takes up another equivalent of carbon and forms carbonic oxide, a gas which, though incapable of sustaining combustion, being itself combustible, would not act as energetically as the carbonic acid or nitrogen in preventing explosion or combustion.

After injecting this after-damp (mixture of about four-fifths nitrogen and one-fifth carbonic acid) into the pit for two hours, a little white cloud coming out of the upcast showed that the mine was full, which fact was easily proved by the gas coming out of the pit extinguishing burning tow, etc. The quantity of gas injected was estimated at 6,000 cubic feet per minute, and the operation was continued for five or six hours after the gas commenced to come out of the upcast. The fire was then drawn and fresh air forced through the mine by the same pits. After two hours and twenty minutes the cloudy appearance at the upcast disappeared, and a lamp would burn in the gas coming out. The fire was found to be extinguished, though it had been burning for nearly two weeks before commencing this operation. The expense of the apparatus was estimated not to exceed five to ten pounds.

In a fire which occurred about two months later (June, 1849) in the same pit, Mr. Darlington applied carbonic acid made in the wet way—with limestone and sulphuric acid. The fire in this case was walled off and the generating apparatus placed in the lower gallery, and a quarter-inch steam jet placed in a pipe inserted through the stopping in a higher gallery. Mr. Darlington says: "We commenced injecting carbonic acid through the four-inch pipe at 2 A.M., and at 5 A.M. the men were at work." Of course the fire was a fresh one, or the rocks would not have had time to cool in that time. The expense was from £10 to £15, or more than that for filling the entire mine with after-damp in the previous case, where the gas was made with "charcoal, the waste coal round the pits, and a little limestone."

Captain Shaw's Opinion of our Fire Brigades.

THE London *Herald* announces the return of Captain Shaw, the chief of the Metropolitan Fire Brigade, to London, from his tour of inspection of the working of the fire departments in the principal cities in the United States, and reports the views expressed by him on the subject of his investigation.

He eulogizes in the warmest terms of gratitude the very cordial and hospitable reception he had met with in the cities which he visited, but he could not disguise his extreme disappointment at having taken so long, laborious and expensive a journey with absolutely no result whatever beyond acquiring a knowledge of the true condition of the several fire departments. His hope had been that in each of the great cities he would have had an opportunity of discussing with practical men the details of organization, training, discipline, drills, economy, mechanical appliances and all the other subjects of interest to those who had adopted the business as their profession, but he had nowhere been able to do this except on the smallest possible scale in consequence of the existing arrangements. He was of opinion that the telegraph makers had also done much for the fire departments, and that the steam fire-engine builders had also done much, but that the officials had done very little for themselves, either by instructing the engine builders and makers of their appliances generally as to the real requirements of the service, or by exercising or practising themselves in the use of such appliances as they have. Their engines can throw water well, but those in use are for the most part heavy, unwieldy and inconvenient in the extreme; and what is still more remarkable, their new ones are in almost every point precisely the same as those first made many years ago. It was impossible to doubt that the builders who originally showed so much ingenuity in the design and construction of their machines would have been able to alter them to suit the requirements of the service, had they been properly advised by practical persons as to what those requirements were; but it appeared to him that the introduction of politics into the fire department, particularly in the selection of their principal executive officers, has been the means of preventing many of the most intelligent and promising members from remaining in charge long enough to acquire such knowledge of the details of the profession as to enable them to point out to the makers of their appliances what was really wanted, and to instruct their men in the use of them when made. It was, perhaps, not generally known in England that the chief officers, or, as they are called, chief engineers, of most of the American fire departments, and the principal assistant engineers are elected—not promoted—and that political influence is commonly paramount in the elections. In some towns the chief and his assistants were appointed by the mayor, and this was probably the better mode of the two; but in whichever way they obtained their places the appointments generally were only temporary, and varied in duration from one to about three years, according to local arrangements. It was hardly to be believed that in the midst of a practical nation like the Americans the chief of an important department, requiring a considerable amount of skill and special training, should be obliged every year to enter into competition with his own subordinates and others, and either to stand continued fresh elections or to lose his place. Such was, however, the case, and the effect of the system is, of course, fatal to the advancement of the professional work of the fire departments. Nothing could exceed the cordial and friendly nature of his intercourse with the municipal authorities, boards of fire commissioners and executive officers of the fire department wherever he went, and in reply to their inquiries he had been compelled to state his opinion freely, that although he considered them perfectly justified in boasting of any institution in which all concerned take a very great interest, and also perfectly justified in placing political partisans at the head of any institution they pleased, he could see no possible justification for combining the two; on the contrary, that if they wished to boast they would have to abandon their political appointments, or if they wished to continue their elections they would have to cease boasting. He had also told them that he had found among the chiefs some useful, active and intelligent men, but that, so far as he could judge, those men had advanced themselves, not by the system, but in spite of it, and wherever he had stated those opinions he had not heard so much as one dissentient voice. He had, therefore, on the whole, come to the conclusion that the present system was doomed, and would be one day altered; and when that day came he had no doubt that the great ingenuity so characteristic of the Americans would be brought to bear on the machinery and appliances of the fire departments, and would have the almost immediate effect of raising them from their present dead level to a much higher position.

They had now powerful and weighty machinery and appliances drawn about by large numbers of horses, and worked by enormous bodies of men, but it could hardly be supposed that the cities would long continue to supply funds for the payment of heavy expenses rendered necessary chiefly by the want of skill and practice on the part of those concerned. It was a very singular and unaccountable fact that the Americans, in their admiration for steam fire engines, had forgotten or ignored the use of hand-worked engines, and had abolished them altogether, thus absolutely depriving themselves of the means of instantly extinguishing fires at their own doors, and so leaving themselves in this particular point far behind the most backward nations of Europe. He had asked in every city why this had been done, but he had not received as much as one reply giving the slightest reason; on the contrary, the answer generally was that the hand engines were of no use—a statement quite without meaning in the face of the fact that some of the principal cities of the world are still entirely protected by them. He was clearly of opinion that no city of any description, and more particularly no large mercantile city, should be without both kind of engines; that the manual or hand-worked engines should very largely predominate in number, and that, as a general rule, every station containing a steam engine should be provided with at least one manual engine in addition, as the latter could be got to work in about thirty seconds by one man, whereas it is almost impossible to get a steam engine to work in less than three or four minutes from the receipt of a call, even when there are plenty of hands present. He found the American fire departments of both kinds (paid and voluntary) formed on a military basis, being composed of a number of bodies called companies, to a great extent independent of each other; making their own promotions separately, but, like several regiments, working together, when called on, under a superior head. This seemed to be understood by all concerned, and to work, on the whole, rather well; but he was convinced that a military organization was badly adapted for such a purpose, and that both economy and increased efficiency would result from substituting his simple organization for theirs. He admired beyond measure the pride and enthusiasm of the Americans about all the institutions, and these among the rest; and although just now the fire departments present many subjects for criticism to a professional observer, he was bound to say that in many of the principal cities they were much improved of late years, and the spirit which seemed to animate all concerned was one which, under altered circumstances, must lead them to eventual success.

New Diamond Fields.

THE discovery of two new diamond fields—those of the Cape and of Victoria—has come in good time to meet the demand. The East Indian supply has long since declined, and the markets have of late years been dependent on Brazil. On the whole, the fashion for diamonds has declined in Russia, Turkey, Spain and Portugal, though a rise was created by the fashions in Paris under the Empire and in the United States. Diamonds used to be, in disturbed countries, for the middle and higher classes a resource for hoarding in political troubles, which gold and silver furnished to the lower classes. The improved political condition of many countries has diminished both modes of hoarding. For small diamonds, or diamond dust for trade purposes, the want has greatly increased, and the price sometimes reaches $3,600 per ounce.—*Engineer.*

The Roads of New York Central Park.

BY WM. H. GRANT, SUPERINTENDING ENGINEER.

VIII.

THE larger portion of the carriage roads of the Central Park —embracing all that has been constructed since 1861—is of the kind designated as *gravel road*. Two different methods were resorted to in the construction of this kind of road. The first is a modification of the Telford plan, retaining the sub-pavement, as in the Telford road illustration, which is the essential feature of that plan, and substituting a covering of gravel in place of the broken stones. The second method dispenses with the pavement, a stone bottom being formed of rubble stones, as seen in the gravel road illustration, deposited on the road-bed with merely sufficient regulating and adjusting by hand to give them tolerable compactness and an even surface, and the finishing layer of gravel, as in the other case, being placed on top. The layer of rubble had about the same depth as was given to the pavement. The first plan, with Telford pavement, has been mentioned as the one that was recommended for the Park roads at the commencement of the work, a sample of which was at that time built. This plan was subsequently adopted and the roads were prosecuted in accordance with it, until, for the purpose of reducing the cost of the work, the later modification was tried, dispensing with the pavement and using in its place the rubble stone bottoming. The special characteristics and details of construction, of these two different kinds of roads, will be described in their order, commencing with

1ST.—THE GRAVEL ROAD WITH TELFORD FOUNDATION.

The pavement for this road was constructed, in all respects, the same as has been described for the Telford road. It will also be understood, that all the work of preparation, drainage, etc., up to the point at which the pavement was completed, was the same as for that road. In this case, therefore, the distinctive feature of the work consisted wholly of *the gravel and its manipulation*. The questions to be considered as to this material, were, its qualities, degrees of coarseness, color, where to be obtained, whether from inland or from the seashore, and how to be obtained in sufficient quantity and at a proper cost, for the purpose ; also, how to treat it when applied to the road, to compact it and produce a firm, smooth and unyielding surface.

The first step in pursuing these investigations, was to procure samples of gravel from all available localities of the surrounding country that were within reach, by such means and distances of transportation as were not too expensive. Numerous samples were accordingly obtained, presenting a great variety of material ; some from the seashore, some from inland, some good and much that was bad, possessing nearly all shades of color and degrees of hardness and other properties. The rivalry and competition between different parties who became interested in the research, exhausted the field within, and considerably beyond, practicable distances from the Park. No available deposit of gravel, it is believed, within fifty miles of the city of New York, escaped examination and a representation among the samples collected. Some samples were brought from nearly a hundred miles distant. The process of collecting the samples extended through several months, commencing before the general plan of gravel roads had been adopted, and continuing for some length of time after the work had been commenced. The information that was thus very thoroughly obtained, upon the subject of the gravel, was not sought merely with reference to the roads, but was desired with reference to the walks of the Park also, and a greater variety of samples and qualities of gravel were examined, for that object, than would have been necessary for the roads alone.

For the purposes of the roads but few samples were obtained that were found worthy of attention. The important requisite of *hardness* was confined, principally, to such as were taken from the sea-shore, but the pebbles of this kind of gravel, are so rounded and smoothed by attrition, as to render them incapable of packing and consolidating on the roads, without too great an intermixture of some inferior and deleterious binding material. The color of this gravel is also regarded as an objection, being mostly white, or of a very light shade ; but this would not be insuperable if the gravel were desirable in other respects, inasmuch as the disagreeable glare to the eye, that is caused by such gravel when used on walks, wears away in a measure, or becomes neutralized after a while upon roads. The pebbles, which are of quartz or silicious stone, are devoid of the quality of toughness, are too brittle and too easily crushed, for good service. This gravel, however, possesses the advantage of cleanliness, which is rare in other kinds, the attrition it has been subjected to having worn away the softer varieties of stone that may have been originally intermixed with it, and the action of the water having removed the disintegrated particles, together with all lighter or earthy matter. It is for this reason, suitable to be employed as an ingredient in concrete ; but as a road material it is not desirable.

The gravel that was obtained from inland localities, or from deposits that have not been subjected to the action of running water, commonly termed pit-gravel, was found mostly to have been derived from the inferior rock, as sand-stones, slates, micaceous gneiss, etc., and was consequently soft or friable, very unequal in texture and contained a large proportion of sand, together with dirt and vegetable matter. Some samples that were intermixed with harder gravel, that could have been profitably used if separated, contained so large a proportion of fine gravel and inferior material that it was impracticable, on account of waste and the expense of screening, to make it available. The unevenness of the size of the pebbles, and the disproportion that prevailed, between what was really gravel, such as was demanded, and what was sand and dirt, was the general fault of the pit-gravel. From this it will be seen that it was difficult to obtain such gravel as was wanted. The requisites that were sought, and that were held to be of the first importance, viz. : that the gravel should be hard, coarse, even and clean, and not water-worn, could not all be found combined in the same material.

The best that could be done was to select from among the different localities that were developed, the one that would furnish gravel, containing in the greatest degree, the requisites desired. In making this selection the mere samples of gravel were tried in actual use, on both roads and walks, and a close examination was given to the results of rolling, packing and wear, and to the effects of the weather—rain and frost. The cost of screening, and the amount of the resulting waste, and other facts, drawn from experiment, use or analysis, were ascertained and considered before an ultimate decision was arrived at. As regards the gravel that was used in the walks, these tests will be further mentioned when treating of that part of the subject. In the case of the roads, the selection was made upon somewhat different grounds from those that governed in regard to the walks, and the decision finally settled upon the choice of gravel from a deposit on the bank of the Hudson River, south of the Highlands. This gravel was found to be hard and unusually clean, and portions of it, in some parts of the bed, of a nearly desirable uniformity as to size. The pebbles, although somewhat rounded, were not water-worn and polished as in the case of beach gravel. The color, a bluish grey, was about what was desired.*

It was found, in applying it to the roads, that, unlike most other kinds of pit-gravel that were tested, its freedom from earthy impurities prevented it from packing properly under the roller, and that it required for this purpose an intermixture of twenty to twenty-five per cent. of inferior material, to give it the necessary binding effect. This proved to be an advantage rather than otherwise, inasmuch as binding material, from extraneous sources, could be obtained at much less cost than gravel, and it was found that it could also be selected of better quality, when foreign to the gravel, than when it was contained in it. The material desired was not generally difficult to obtain. This was a sandy and clayey loam. It was not found necessary to apply it to all the gravel—only to the surface of the last or top layer of the road. Experiments were tried with sea-beach gravel, but it was found, very much as was anticipated, that in its ordinary state it possessed no binding properties, and that no amount of rolling would pack it so that it would retain a firm surface upon the road after it became dry. It was necessary to intermix it so largely with binding material, in order to pack it, as to destroy the character of the road as a gravel road, by impairing the hardness of the surface. In one instance, when this kind of gravel was used to complete a short piece of road, the supply of other gravel having failed for the time, it became necessary, from its impracticable nature, to subsequently remove it and replace it with the better gravel. So much is found to depend upon *the quality of the gravel*, in the successful formation of a gravel road, that it is a matter that cannot be too clearly and distinctly kept in view. In closing this part of the subject, therefore, a recapitulation is presented of the essential characteristics of the material.

First —It must be hard and tough, or the action of wheels and steel-shod hoofs, combined with the disintegrating effects of the weather, rain, heat, and frost, will soon pulverize it and convert it into dust or mud. *Second—It must be coarse and measurably even in size ;* coarse, to give it strength to resist the necessary service—even, to enable it to form a proper surface and to wear equally. *Third—It must be clean ;* all impurities impair its value, affect the hardness of the surface of the road, cause dust and mud, retain moisture, and add force to the action of frost. The least quantity only, of inferior material necessary to bind the surface, should be used. *Fourth—It should not be water-worn*, or at least it should not be of the kind—found on or near the sea-shore—that has been *very much* water-worn, rounded and polished, as such gravel cannot be packed without the interposition of so much inferior material as to destroy its essential characteristics on the surface of a road. Besides these points, *sameness of texture or an even degree of hardness* in the separate pebbles, may be mentioned as necessary to produce a uniformity of wear of the surface. The color, also, is of some importance, dark shades being preferred to light ones.

It is, of course, impossible to find gravel combining, in its ordinary state, all these advantages. If it contain, in any considerable proportion, pebbles that are *hard* and *coarse*, to begin with, the requisites of evenness of size, and cleanliness, may be added by screening out the finer portions and dirt. This process is expensive and wasteful, and is to be avoided if practicable. It will be better, however, to incur the expense and waste than to use improper materials and hazard the character and *real economy* of the work.

In proceeding with the construction of the road, the gravel was deposited upon the prepared pavement, generally in two successive layers, making together, when completed and fully compacted, a depth of four to six inches ; the depth was not less than five inches in the middle of the road, and not less than four inches at the sides. The first layer was composed of coarse gravel, in its natural state, as it came from the gravel bed. As the gravel was clean, and the finer portion constituted but a small part of the bulk, it was not considered necessary to screen it for the bottom layer. It was deposited at first by wheelbarrows, until a sufficient breadth was formed to drive wagons on, and then it was deposited by wagons driving over the layer and backing up, so as to discharge their loads without permitting the wheels to come in contact with the pavement. This layer was adjusted by raking it over evenly, and then rolled down with the lighter two-horse rollers. It was kept properly tempered by moistening—neither too wet nor too dry—by means of sprinkling carts, or by the use of hose attached to the road hydrants (when these had become available), while the rolling was going on, and was firmly compacted, so as to resist indentation by the horses' feet before adding the next layer.

The gravel for the second or top layer was screened ; the pebbles from about one and a half inches down to about three-fourths of an inch, the largest way, being separated from the finer material, and applied to the road (the finer portion being reserved for use in the walks, for which it was found to be well adapted). In the process of screening, a considerable quantity of pebbles or small stones, above the size desired for the roads, was obtained, which was usefully employed in making gutters to the walks, where required. The method that was adopted in screening the gravel will be described hereafter. The screened gravel was spread over the bottom layer, and after raking and adjusting it to an even surface, the binding material was added. This material was chiefly obtained from the Park excavations below the surface-soil, and was composed of sand and gravel intermixed with loam and clay—not very dissimilar to the material known as hard-pan. Hard-pan itself (indurated sand and clay) was selected as preferable, whenever it was available without excavating it specially for the purpose. This was spread over the gravel, forming a light coating, not exceeding an inch in depth, care being taken to spread it evenly and to pulverize all lumps ; it was then properly moistened by sprinkling, and rolled, first with the light rollers, and next and finally with the heavy roller.

The sprinkling and tempering of the gravel was carefully attended to while the rolling was going on, not allowing it to become too dry or too wet, as in either case the rolling could not be done effectively. No rolling was permitted after a drenching rain until the gravel had had time to dry out ; and in case of a rain of such duration as to affect the road-bed below the pavement, the rolling was suspended until such time as the operation of the drains had fully and securely restored the ground to a firm condition. Any disturbance or unequal yielding of the pavement, that would have been liable to occur by the premature use of the heavy roller, at such a time, would have been detrimental to the work. Men were kept in attendance who were skilled in raking and shaping the road surface, to keep it true to the required contour or crowning form, transversely, and to the correct grade-line, longitudinally, of the road.

By the repeated sprinkling, raking, and rolling, the binding material spread over the surface was worked down into the gravel to the depth of two or three inches, filling all interstices and surrounding the pebbles so as to hold them tightly in their places, and forming a firm, even surface, and one that was nearly impervious to water. The rolling was thoroughly done, every part of the road being passed over from eighty to one hundred times, subjecting the gravel at all points to a pressure, in the aggregate, (the weight of the roller being about six and a half tons,) of five hundred to six hundred tons. The effect of this was a very complete consolidation of the material. Very little of the screened gravel was crushed in the operation, the hardness, size, and shape of the pebbles, protecting them from that result. The gravel and coarser sand, contained in the binding material, were to some extent ground up, and the particles forced into the interstices between the pebbles. When the road was finished, the surface presented a sandy or earthy appearance, as was previously remarked in the case of the broken-stone roads, the gravel not distinctly showing until after the road had been a short time in use, or after a rain.

It should be observed, in regard to the rolling, that attention was first given to the rolling of the gravel along the sides of the road adjoining the gutters, (the gutters having been previously laid), in order to counteract a tendency of the gravel, if first rolled in the middle of the road, to work off in a lateral direction. It is also worthy of note, that in the construction of the original sample of gravel road, the experiment was tried of compacting the gravel (which was not screened) without intermixture with other substances, The result was similar to that in the case of the broken-stone roads, before mentioned, in which the attempt was made to consolidate the stone without the aid of binding material. The gravel would pack well under the roller, and retain its firmness so long as it retained its moisture ; but when it became dry it lost all cohesion.

The material first resorted to for binding purposes, was the detritus and scrapings that were left after the removal of the heaps of MacAdam stones from the places where they had been broken. This answered a very good purpose, but the supply was too limited for general use. Lime-stone chips (refuse from the lime-kiln quarries) were next tried with successful binding results ; but the great care that is necessary in using this material, and the difficulty of procuring it in proper condition, render its employment next to impracticable. It is liable, also, if used in excess, to produce, in dry weather, a very disagreeable impalpable dust ; and in wet weather, an equally disagreeable tenacious mud—these difficulties being inherent to all lime-stone roads. The material that was finally resorted to, as previously mentioned, is regarded, upon the whole, as the best and safest kind for binding purposes that is generally available.

(To be continued.)

* Other deposits of the same quality of gravel have since been developed.

Engineering in the Brazils.

BY the last advices from Brazil it appears that the Government, under an Imperial decree dated the 7th of August, has sanctioned the plans submitted by the engineers, Messrs. Brunlees and Lane, for the Rio commercial wharves, and a branch railway to connect them with the Don Pedro line. When these comprehensive works are carried out, and the Don Pedro Railway is connected with the proposed wharves, the constant complaints as to the want of shipping accommodation will, it is stated, cease, and the great cost of transhipping and carting goods through the city is expected to be much lessened.

The Gold Fields of Oregon.

BY THE REV. T. CONDON, OF DALLES CITY.

THE gold fields of Oregon cluster around its mountain-ranges, and may accordingly be designated by the names of its principal chains of mountains; as, that of the Coast Range, the Cascade Range gold region, the Blue Mountains gold field; those of the three cross-ranges of mountains, in south-western Oregon, known as the Siskiyou mountains, the Umpqua mountains, and the Calapooya mountains, and those of the Snow and Puebla mountains, in south-eastern Oregon.

The gold of the Coast range has only been found in paying quantities in the sands of the sea beach, from which it is washed at low tide. These beach-diggings extend for hundreds of miles, with gold enough yet left in them to pay moderate returns for ordinary labor; and with a record running back over a period of twelve or fifteen years, whose statements may be divided into the "reasonable," the "marvellous," and the "fabulous;" and the numbers corresponding to each successive stage be stated at $12 to $15 per day to the hand, $50 to $100, and $800 to $1,000 per day—the last figures, doubtless, seldom found. The gold of the beach is found in heavy, black sand, apparently either brought down from the interior by the rivers of southern Oregon, which come from a gold-bearing region, and distributed along the beach by the waves of the ocean, or else derived from broken-up ledges of gold-bearing rock near where it is found—the latter supposition seeming to find confirmation in the fact, that the best diggings (not only, but the only ones that have paid at all) are either around those capes and sunken ledges of rock that mark the extension seaward of the cross-ranges of mountains, the Siskiyou, the Umpqua, and the Calapooya, or else places where spurs of the Coast range itself come down to the sea. We find accordingly, around—1st. The seaward extension of the Siskiyou mountains, at Point St. George, near Crescent City, extensive beach-diggings; 2d. The extension, seaward, of the Umpqua mountains, marked by a ledge of rocks running out four miles into the ocean, and only lost in the increasing depth, which is, too, surrounded by important beach-diggings; 3d. From Cape Perpetua, several miles northward, marking the extension of the cross-range of the Calapooya mountains, and extensive beach-diggings, still worked with paying results. *At, or near, one of these three points*, have been found the principal gold-diggings of the beach, while in every instance not connected with these points in which gold had been found, the other class of facts were present, viz.: the extension down to the sea of some spur of the Coast range.

The inquiry naturally arises: Did the storm-surf disengage the gold from these sunken ledges of rocks, these heads of gold-bearing mountains, here plunging into the sea? or did the rivers bring it from the interior—the waves only distributing it along the beach in the direction in which prevailing winter storms would drive it—sunken ledges of rock extending across its path, arresting and holding it in their eddies?

Marvellous stories are told of the wealth taken in former years from some of these diggings. They are still worked, in three or four places, with paying results. They extend from the California line to the Straits of Fuca, but the principal ones are those named. Another gold-field exists in Oregon, among the slopes of the Cascade range.

The Willamette Valley, which separates the Coast mountains from the Cascade mountains, is part of a vast trough, extending, in its general features, from Puget Sound to the Bay of San Francisco, which is, in its Oregon portion, so filled in by tertiary and post-tertiary deposits, that its older rocks are, for the most part, buried far from sight. It is only in ascending the slopes of the Coast range, on its western margin, or those of the Cascades on its eastern, that older rocks appear. All the streams that fall from the western slopes of the Cascade range contain more or less of gold in their bars. The Clackarnas, the Molalla, the Santiam, the Calapooya, and the forks of the Willamette, have all been found to contain gold; only that of the Santiam has been worked.

There is that in the gold of the Santiam which invests it with peculiar interest to the mineralogist. It often presents the most beautiful systems of lacework, in gold threads, and semi-crystal forms of great symmetry and beauty. A beautiful cabinet of these specimens may be seen in Salem, in the office of the company owning the Santiam mines. The Santiam mines are not now worked, though they once awakened a good deal of interest. It is a curious fact that little or no gold has been found in the streams of the eastern water-shed of the Cascade mountains, opposite the Willamette valley, while those of the western slope, so uniformly, show its presence. It looks a little as if the fractures of the range from which its floods of trap escaped were nearest the eastern edge, and buried its older rocks on that side to a greater depth than on the other. The other volcanic materials, ash and pumice, would, most naturally—aided by prevailing western winds—drift in the same direction. Another gold-field exists in Oregon, among the ridges and slopes of the Blue Mountains.

In the region between the Cascade range and the outlying spurs of the Blue Mountains, the older sedimentary rocks are, for the most part, covered by trap and tufa; the trap varying in thickness from hundreds of feet, as seen at any of the crossings of the Des Chutes, to a thin capping on the hills, sixty miles farther east; the tufa, as stratified sediment of ancient lake beds, extending east and south-east over vast areas—its materials varying from fine volcanic ash to coarse masses of pumice and obsidian. Travelling eastward, the trap is found at its, apparently, greatest thickness in the trough of the Des Chuttes, where one can count as many as thirty distinct overflows, varying in tickness from ten to twenty-five feet, and covering entirely from sight, even in the deepest canyons, the older sedimentary rocks. Fifteen or twenty miles farther east one gets a glimpse of the sedimentary rocks in the bed of Trout creek, though yet covered by 75 or 80 feet of trap; twenty miles still further east the trap has thinned out to only a capping on the hills, while the varied strata of the tertiaries are in full view on every side in the region of the Currant creek and the John Day's river. The lowest members of this tertiary series of Current creek are richly stored with the most beautiful specimens of fossil botany in the country. This order of succession of the rocks, as we travel eastward, is the same whether we travel farther south along the valley of Crooked river, or that of the John Day's, which, in its upper portion, also runs east and west, or in an intermediate line by Antelope valley and the Canyon City road. But this series reaches the largest number of members along the line of the Crooked river valley, for on reaching the forks of that stream, for the first time on our journey, we come to abundant and beautiful marine fossils.

Among these marine fossils there is one in so great abundance as to characterize the rock—a beautiful trigonia, resembling T— Evansii, of the California survey. Ammonites, turillites and other beautiful forms abound. I am the more particular to notice this outcrop of marine fossils, for here are found the first indications of gold in our approach to the Blue Mountains in this line of travel, and these indications increase from that place till we reach paying-rock at Canyon City, Willow creek, Mormon basin, and a score of other mining camps of the Blue Mountain region. A few miles still farther eastward, from this outcrop of trigonia rock, other and apparently older marine rocks come to the surface; among these a limestone, containing rhynconella, cyrtoceras and other marine shells, in the greatest perfection and abundance. The eastern slopes of the Blue Mountains have, too, their marine rocks; among these a dark blue limestone with a small Productus in great abundance through it, is often met. These marine rocks lie against the outlying spurs of the Blue Mountains on the south-west, south and east—as an apparently ancient shore-line around an island—while the wide extent of lower country south, to the California line, is covered with volcanic materials, mostly as stratified tufas, in which masses of pumice and obsidian abound.

It was stated above, that the same succession of rocks was encountered in travelling eastward along the line of the valley of the upper waters of the John Day's; one considerable exceptional mass of rock occurs in this line of travel, at about 60–70 miles east of the Des Chutes. It stands as a sort of island of slate-rock—without any appearance of fossil remains—surrounded on every side by more recent and plainly Eocene tertiary rocks. The slates are traversed by veins of quartz, in which are traces of gold. Some work was done here a few years since in crushing rock, but without paying results. An abandoned arastra may still be seen, in a valley that opens into Currant creek, near the Canyon City road, built to crush this rock. Dykes of trap are near. The strata are all very much disturbed around this older slate, but it is only an isolated spot of gold rock, with no apparent connection with the mass of its kind farther to the east. But while gold is thinly distributed here, fossil remains are not. The slate itself has no trace of organic life, but an ocean of tertiary surrounds it, and in this tertiary fossil remains are beautiful and abundant. A broad belt of this tertiary extends from the valley of the Crooked river, north across the line of the John Day's and on toward the Columbia river, whose lowest member, in some localities, abounds in fossil bones plainly Eocene, and in a portion of that same member at Bridge creek, schistose rock occurs full of vegetable forms—some of whose leaves measure 25 to 30 inches across, and these arborescent, too. This whole central region of Oregon, though now apparently poor in gold, is certainly rich in geology.

Of the country east of the Blue Mountains I can say but little, the only knowledge I have of it being derived from geological specimens brought me from that region by friends. I have not yet visited that portion of Oregon.

THE SNOW MOUNTAINS AND PUEBLA MOUNTAINS.

These mountains, extending into the south-eastern corner of Oregon from Nevada are, to some extent, gold-bearing; silver and copper ores are also found there, with what promise of future value remains yet to be ascertained. A vast lake depression separates these from the Blue Mountains with no marked feature of interest to the mineralogist.

THE GOLD FIELDS OF SOUTH-WESTERN OREGON.

The Siskiyou, Umpqua and Calapooya mountains—three cross-ranges running from the Cascade range to the ocean—are gold-bearing, and their mines are still worked to some extent. During the years 1852, '53 and '54, these mines were very productive; they are still worked, but mainly by Chinese labor. I have never visited that region, and have but little knowledge of the geological surroundings of these mines.

Gold Quartz Mining.

IT seems probable that the Sierra Butte or Downieville Peak, about ten miles east of the town of Downieville, California, will soon take rank next to Grass Valley as a centre of gold quartz mining. The Sierra Butte, or Reis Mine, has been more regular in its yields and its profits for the last fifteen years than any other mine in the State. The Independence, adjoining it, is also rich, but has been badly managed; has lost several mills by snow-slides, and has not recovered from the debts incurred on account of them. The Keystone, only three miles distant, on the opposite side of the North Yuba, has lately risen to be one of the most profitable quartz mines of these regions. The Monumental, a mine newly opened at the Butte, had lately turned out one piece of gold weighing 106 pounds, and worth $25,000.

The French Atlantic Cable.

IT is stated that the number of messages passing over the French Atlantic Telegraph during the week ending the 4th of September was 448, the earnings of the cable during the same period being £1,040.

MINING SUMMARY.

California.

THE ALPINE COUNTY MINES.

WE cull from the Monitor *Miner*, September 18th, the following items of news:—

"It is the intention of the owners of the Leviathan mine, under the advice of Professor Rickard, to erect at once a smelting furnace at the mine. This is one important trial which has often been talked of but never arrived at in Alpine, whether our argentiferous copper ores could be smelted with profit at home.

"Mr. Schwerin, resident director of the Tarshish mine, has a gang of men at work taking the water out of the shaft preparatory to a permanent resumption of work.

"Beautiful are the steel-gray crystal sulphurets upon the quartz now found in the Globe tunnel. No test of their value has yet been made, but they look well.

"Giant powder now used successfully in the Imperial, Mt. Bullion, Globe, and Monitor C. M. tunnels near this place, and the same with single-hand drills, will be introduced in the Tarshish mine next week.

"One thousand tons of Leviathan ore, it is said will be immediately shipped from the mine for England. This looks like business.

"No. 3 tunnel of M. C. M. Company is driving in at a satisfactory rate."

NEVADA COUNTY.

From the Nevada *Transcript*, September 15th, we learn as follows: "The Prescott claims at Omega have been worked this season by George W. Kidd & Co., and first rate results obtained. We saw yesterday two bars, worth $10,500, the result of the last washing. The gold from Omega is of extreme fineness, assaying $20 to the ounce. A partial clean up made before the last, yielded $3,200, making a total of $15,700. The success of Ole Allen, in demonstrating the existence of a channel in the Kansas ground, has attracted the attention of other parties, and a company has been organized in San Francisco, which will, in a few weeks, commence operations in the adjoining claims. The opening of the channel will give employment to a number of men and yield a large amount of bullion. The signs of the times for this locality are getting brighter every day."

ALLISON RANCH.

The Grass Valley (Nevada county) *National* thus refers to this mine: "Things at the Ranch still look flattering, and the owners, Davis & Colbert, are feeling greatly encouraged, and will have all the water out of their mine in a few days, not having over twenty feet now to pump. The new sixteen-inch pump does its work effectually, and it has not been necessary to stop it an hour since it has been put down. By the 1st of October men will be at work sinking on the old shaft. The Cariboo ledge is keeping up its lick, and continues to yield ore which pays from $125 to $200 per ton. Excellent ore is also being taken from various parts of the mine."

RICH QUARTZ IN PLUMAS COUNTY.

The Quincy *National*, September 11th, says:—"We were shown this week some very rich quartz from a ledge four miles from this place, opened a few weeks ago. It was located for a San Francisco company, who would to-day have a mill running had it not been for certain misrepresentations. Some of the rock paid, by mortar, upwards of $10 a pound. A tunnel is about being run along the lode."

NEW GOLD DIGGING IN SAN BERNARDINO.

The *Guardian*, September 11th, says:—"Our little burg was considerably exercised on Tuesday, by the report of rich gold diggings in the vicinity of Lytle Creek. Some forty or fifty persons have left town for the placers. All sorts of rumors are afloat. We learn that the new placers are between the headwaters of the San Gabriel and Colorado."

SIERRA COUNTY—THE BUSH CREEK MINE.

In noticing the mill and mine of this company, the *Messenger*, September 18th, says:—"We paid a visit to the Brush Creek mine and mill on Saturday, and think it is one of the most complete establishments that has ever fallen under our notice. The mill building is a most substantial structure, forty by ninety feet in the clear, with a wing, or L, twenty by forty feet, in which are the engine and boiler. The mill has power for twenty stamps, though at present running only 10. It has two Knox pans and a Payne & Stevens patent buddle. The machinery is driven by a 50-horse power engine. The shaft is 300 feet deep. In the past, there has been taken out and crushed 3,380 tons of quartz, which has yielded for the year's run of fifty-two weeks, a total of $105,805 04, or an average of $31 31 per ton."

Nevada.

RAILROAD MINING DISTRICT.

THE Elko *Independent*, of September 29th, has the following concerning a new mining district in that region:—"The above is the name of a new mining district which was organized in June last, but being under the control of a few persons, no effort has been made since its organization to create any excitement or bring it to the notice of the public. Recent discoveries and developments of its mineral resources, however, seem to indicate that it is soon to become one of the mineral-producing districts of the State. The boundaries of the district are as follows: Commencing at the mouth of the south fork of the Humboldt; thence down the Humboldt river to Palisades Station; thence up Pine valley to the Emigrant road; thence along the Emigrant road and Railroad canyon to the toll-road in Huntington valley, to the south fork of the Humboldt river; thence down and along the south fork of the Humboldt to the place of beginning. The district was first formed for the purpose of locating and securing extensive deposits of rich magnetic iron ore; but since the discovery of iron, extensive deposits of copper and silver have recently been discovered in the district. The copper mines equal, if not surpass those of the Battle Mountain district. The silver mines are located on the same range of mountains as those of Mineral Hill, and are of the same character of ore. The tests made of the copper show forty-four and a half per cent. of copper and seventy dollars per ton in silver. Selected specimens of the copper ore assayed as high as sixty per cent. Railroad district seems to have been appropriately named, having the line of the railroad as one of its boundaries, and being in such close proximity to railroad communication, it must eventually become of considerable importance. What adds more to the value of these copper mines is the amount of silver the ore contains, as that will amply defray all the expenses of mining and transportation of the ore to market. The distance from the mines to the nearest point on the railroad does not exceed twelve miles. There are direct routes from Elko, Carlin and Palisades to the mines. The owners have received an offer from an agent representing an English company for two of their copper lodes, which they refused. They intend shipping ore to market direct from the mines immediately."

THE MINES NEAR UNIONVILLE.

A correspondent of the Elko *Independent*, writing from Unionville, October 3d, of the improvements and increasing confidence in the permanency of that thriving mining town, speaking of the mining interests centrein g there, says: "If real estate operators are asked

upon what they ground their faith of a rapid demand for and increase in price of real estate, they involuntarily answer that the increased shipments of bullion and rich ore justify their sanguine hopes, which has led me to make some inquiry concerning the subjects, resulting about as follows: The product of the two mines worked by John C. Fall & Co., and S. D. R. Stewart & Co., is much greater per month than at any former time. The shipment of fine bullion for the month is about one ton, worth $15 per pound, making about $30,000 for the month. In addition to this, each company has shipped about 25 tons of rich ore, worth $450 per ton, making an aggregate value of $24,000, or a little over $50,000 per month, as a total product of the two mines. With this encouraging exhibit, it is said that the mines are improving every day as work progresses and the mountain is penetrated. Both of the companies are now hoisting ore to the surface faster than they can reduce it with their milling capacities, and hence an increase of stamps may be looked for before long in this place.

"The new mill for the National mine, above town, started up yesterday, but as yet I have heard no report as to the manner of its working. There are several other mines, in addition to those named, being worked in the district, but none of them have yet reached a point where they can be called productive properties, and many of them, in all human probability, never will."

SALE TO A NEW YORK COMPANY.

The following item is from the White Pine *News* of the 11th ult.: "A sale has been effected of a mine on Pogonip Flat to a New York company—something over $200,000. An expert is now examining the mine, and he is so well pleased with the purchase that he will have the bargain closed by telegraph."

BULLION PRODUCTS.

We take the following from the White Pine *News*:—"W. C. Child, of Wells, Fargo & Co.'s office in Treasure City, furnishes the following statement of the shipments of White Pine bullion for the year ending September 15th, 1869: From Hamilton, $1,511,198 25; Treasure City, $526,891 98; Shermantown, $352,829 12; Newark, $106,238 54; Austin (White Pine bullion), $535,059 74. Considering that up to the month of February of this year, there were not to exceed forty stamps in motion in the district, and at no time until the last of May, have we employed a greater number than sixty, the above should be accepted as a pretty fair showing. We predict that the footing up of our next annual shipment will not fall far short of $7,000,000."

Relative to the mills and their effect on its bullion product, the *Inland Empire* says:—"About the first of October, sixty new stamps will be running in this district. They will average one ton per day per stamp, including stoppages; and as the ores here still continue to average within a fraction of one hundred dollars per ton for all that is crushed, we may expect this weekly increase on shipments after these mills start to be about forty thousand dollars. By Nov. 1st we expect the shipment will be at the rate of one hundred and ten thousand dollars per week, or hard on to six millions dollars per year. And yet the dump piles are increasing every day, and the best informed miners here assert that the mines never looked so well as at present."

The Manhattan Mill at Austin is producing over 13,000 ounces of bullion per week; the Metacomb 12,000.

AFFAIRS AT PAHRANAGAT.

The White Pine *News* says:—"From a prospector just returned from the south, along the Colorado, we learn that some of the mines at Pahranagat are being worked with good results. On one claim a shaft is down 300 feet, showing a well-defined fissure vein, about eight feet in width. The claim referred to—but the name of which our informant did not remember—employs about sixty men, and furnishes a sufficient amount of ore to keep a good sized mill in constant operation. Other claims in the district are also looking well, and some of them are being worked under favorable auspices."

CHARGES FOR REDUCING ORES AT AUSTIN.

The Austin *Reveille*, September 21st, says:—"A correspondent, writing from the Reveille district, wishes to know the present charges for reducing ore in this city, and whether the mill owners descriminate between chloride and sulphuret ores. He adds: 'I have just been informed that a Stetefeldt furnace has been erected in Austin, by the use of which the cost of roasting and chloridizing ores would be reduced to $5 or $7 a ton. If this information is correct, I suppose the mills of your city, or at least the one having the patent furnace, do not charge over $25 or $30 per ton for working ore. There is a vast quantity of ore in this district that would bear transportation to your city and such mill charges and leave the owners a fair compensation. The miners of this district cannot stand the old prices, and I believe they are played out generally.' Since the reception of the above note we have not had time to make particular inquiry respecting the charges for reducing ore by the mills in this district, but we believe the present rate is $35 per ton on a guarantee of 80 per cent. This rate is for sulphuret ore which requires to be roasted. We believe the rate is higher for ore of the highest grade, the care and expense of roasting which is greater, and where the owner receives the 'clean-up.' The charge is the same for chloride and sulphuret ores, as the best chloride ores found in the district now-a-days may be sent to the furnace with advantage. Our correspondent has been misinformed as regards the erection of a Stetefeldt chloridizing furnace in this city. The inventor of that furnace, Mr. C. A. Stetefeldt, is engaged at the present time in building one of his peculiar furnaces at the mill of an English company, near the town of Reno, the completion and successful testing of which will be accomplished before the expiration of this month. It is admitted, we believe, that the principle of the Stetefeldt furnace—the superior affinity of chlorine and silver—has been fully demonstrated, and the only probable obstacle to its success will be mechanical. The cost of roasting ore by this patent furnace is correctly stated and agrees with the estimates of the inventor. As our correspondent remarks, high rates for working ore are 'played out' generally. He might have added to the list of things played out the excessive rates of labor and supplies of all kinds with equal truth."

Montana.

ANOTHER EXPERIMENTAL FURNACE AT ARGENTA.

THE Virginia City *Republican*, Sept. 17, has the following account of a new Experimental Furnace recently erected by Mr. Harrison, at Argenta, for smelting the silver ores of that district: "It dispenses with blast and charcoal, and is operated by a wood fire and draft. The fire boxes surround the reservoir, and the flames unite, and by means of a draft thrown upon the ore with all the power and intensity of the blow pipe. The melted matter remains in the reservoir and aids the process of smelting. The slag is drawn from the metal through an orifice above it, the metal remaining perfectly pure in the bottom of the reservoir, whence it is drawn through the tap, when the run is completed. Two and a half or three cords of wood are required every twenty-four hours, and four hands, constituting a day and a night shift of two each, to attend to feeding the furnace and fires.

"Major Veale left Argenta on Thursday, after the furnace had been forty-eight hours in operation as an experimental test, and it was running without the slightest difficulty. The brick of which it is constructed are made from clay taken from the coal mine three miles below Argenta. They are equal to the best German fire-brick.

"The whole cost of construction will not exceed $1,000. The cost per ton of smelting silver ore by this process will be reduced to four dollars and fifty cents. If the furnace proves, as it promises, a success, it will bring within the means of any of our citizens the power to work the inexhaustible galena mines of the Rattlesnake district, and speedily make that the greatest bullion producing district in Montana.

"We learn from Major Veale that the mines are rapidly undergoing development—ore is abundant, and none so poor that with the aid of a Harrison furnace would not pay abundantly. Messrs. Cummings and Veale have taken a large quantity of ore from the Atlantic Cable. The lode improves by excavation. They are awaiting the return of Mr. Rompf from the East to resume smelting. Confidence is increasing in the permanency and wealth of the Argenta mines, and owners hold their property, which a few months ago could have been bought for a song, at greatly advanced prices."

IMMENSE GOLD BRICK.

THE Helena *Gazette*, Sept. 30, has the following account of the largest gold brick ever seen in Montana: "Bohm & Aub, bankers, had a gold brick run yesterday by F. Bohm & Co., assayers, which weighed 2,711 oz. 13 dwt. troy, and was 870½ fine. The value of this huge nugget is $48,800 34, coin; $68,320 47, currency. The difference in the marketable value of this brick between the opening and closing gold quotations of Friday last, is over $10,000 in currency. No such sized brick has ever before been seen in Montana, but we believe that Bohm & Aub intend to run a few more of them soon. When the moneyed men of the East view this substantial evidence of the material resources of the Territory, it will go far towards forcing them to invest some of their loose capital in the Montana section of the Rocky Mountain domain."

NEW DIGGINGS.

New diggings have been discovered in a gulch lying contiguous to Spruce, between it and Boulder bar. There has been sixty claims recorded, which, so far as prospected, would pay well, but it was expected that no work of any consequence could be done on them until next season, for want of water. Another discovery was made lately on Boulder bar under the big ditch, near Diamond City. The prospects of good paying diggings on the bar are now beyond the peradventure of a doubt, but unfortunately there is only some ten or twelve inches of water in the McGregor, Metcalf & Co.'s ditch, which forces the miners to lay the ground over until spring. When water is available, Boulder bar will be behind no camp in and around Diamond, in the yield of gold.

MINING AT HIGHLAND.

A correspondent of the *Gazette* writing from Highland, Sept. 23, says: "The mill of the Highland Gold Co. has just finished trial, runs on the silver ores of the Thompson, Day and Harvey lodes. It is understood that selected ore from these lodes will yield fine results when chlorinized by roasting—the base metals making this operation necessary. The company is now erecting a furnace for this purpose. A company making such expensive experiments on the lodes of other parties ought to be a great benefit to the territory and the camp, and appreciated accordingly.

"Two arastras are running on the select ore of the Only Chance, with the usual fine results. Water is so scarce that the arastras could not move, but for that coming from the Ballarat tunnel, which is furnished free of charge by the company.

"The Gold Co.'s mill made one run last winter on the refuse quartz of the Only Chance, with good results. It is now being prepared to make a run on the average ore of that rich lode. A part of this lode has changed hands within the last few days, and rumor has it, that there are some portions of this, and the silver lodes, the Thompson, Myers, Day and Harvey, may pass into the hands of other parties for more rapid development.

"The Only Chance is the best developed lode in the camp, and has been remunerative from the first; and the other lodes named promise to be profitable where regularly worked."

Colorado.

THE BULLION PRODUCT FOR SEPTEMBER.

THE Georgetown *Miner*, September 30th, says;—"There is considerable improvement in our bullion returns for the month of September, which is accounted for from the fact that the Brown Company has renewed smelting and the Baker have commenced making shipments.

"L. Huepeden & Co. report 10,193.60 ounces, coin value, $10,214 60. Their capacity will be doubled within a week, when their monthly product will reach $25,000, if they are kept fully supplied with ore, which we hope will be the case.

"The Brown Company have shipped 580 pounds troy, or 6,960 ounces, coin value, $9,396, being the largest mass of silver ever produced in the United States. They will start up again the early part of next week, and we are in hopes they will be able to run continually, which present appearances fully indicate

"The Baker Company have shipped 1,373 ounces, the coin value of which we have not fully ascertained, which we place at $1,373, but do not vouch for its accuracy. They are now running one cylinder steadily and a second one a portion of the time, and are in hopes to have all three running soon. Their shipments for this month will probably be large.

"Stewart has taken out during the month 3,917 ounces, coin value $3,374 72, which, considering the length of time he has been running, two weeks, is a good report.

"The total product for the month was 24,449.60 ounces, coin value $24,358 32, against $14,223 42 for the month of August being an increase of $10,134 90. From present indications the increase during this month will be fully as much."

THE MILLS OF NEVADA COUNTY.

The Central City *Herald*, September 28th, reviewing mining operations in Nevada county, says:—"The mines, besides furnishing ore for ten mills and 123 stamps in Nevada, keep many mills in Black Hawk and other localities busily employed. Potter & Hawley's new mills at the bend of the Gulch in Nevada, are running fifteen stamps for Sabin, on ore from the Forks lode. Beverly & Koontz are running the Blue mill (12 stamps) on ore from the Missouri lode. Clayton is crushing rock from the "Ophir" Prize, and other lodes, at his twelve stamp mill. Potter & Hawley are running the New Bedford mill on Jones and Kent Companies' ore. A large amount of ore is being taken from the California lead owned by Stalker & Standley. This is one of the most remunerative mines in this county. Its average yield per cord is from 12 to 14 ounces. The Black Hawk Company's mill is running 20 stamps, and J. V. Kimber at Black Hawk, 15 on California ore. B. C. Waterman is running the Eureka mill in Eureka Gulch, on "Forks" and "Seymour" ore—10 stamps on the former and 5 on the latter. He is also running 12 stamps at the Kas-Colorado mill, on ore from the Gardener lode. The parties who recently jumped the Philadelphia mine, have abandoned it. Mr. Waterman attached the ore as fast as it was taken out, when they paid costs and quit. Whitcomb's mill has been shut down the past few days for repairs and will start up on ore from Peck Gulch. Waterman is taking but little ore from the Flack lode at present, being engaged in sinking the shaft, which has now reached a depth of 380 feet below the surface, and in opening a new crevice. The hands in the Ophir have again taken that mine to work by consent of the agent, until such time as they shall have realized a sufficient sum to liquidate the back pay due them by the company. Sullivan's mill has been running on this ore. Cass is crushing ore from the Jones lead for Sullivan & Barney, at the old Boston 12 stamp mill. He will soon start up the old Ophir mill (13 stamps) on ore from the Ophir mine. W. O. Logue & Company are running the 12 stamp mill above the old "Boston," and Chatfield, the mill below, steadily night and day. The Burroughs turns out an immense quantity of ore which is principally crushed in Black Hawk. The Jones lead gives one of the best yields per cord of any mine yet discovered."

AT BLACK HAWK,

The Central City *Register*, September 23d, says:—"Nearly all the mills at Black Hawk are running to their full capacity, and most of them are constantly crowded with more ore than they can crush. The Briggs is idle for a short time for the purpose of overhauling the stamps and making some other necessary repairs. The Smith & Parmelee is running full on the company's ore, and the mine is furnishing a considerable quantity of ore to custom mills. No. 1 Gregory is fully supplied from the Black Hawk mine. The Black Hawk mill has forty stamps at work on California rock, for Stalker & Standley, and the other twenty on company ore. Mr. Congdon informs us that one hundred cords of California ore will be crushed at Black Hawk this month. The average yield is about thirteen ounces per cord—over two ounces per ton. Jack Terry's and Fitzpatrick's mills are both constantly at work, as are also the Empire and Holman, but we did not learn what mines they are supplied from. The Kimber mill is crushing from the California. A steam engine has just been started in this mill—is now driving twelve stamps, and will drive the whole twenty-four during the winter months. The Hurd mill is leased by Messrs. Beach, Briggs & Hutchinson, and is reducing rock from their mine on the Pleasant View lode. The old Chicago is running steadily on custom rock. Messrs. Lake & Fields are overhauling and refitting the old Bobtail mill. Mr. Lake has just arrived from the States, bringing with him a full outfit of new machinery for it, stamps, steam engine, boiler, etc., which will be set up and put to work immediately. Meade's old water mill is at present idle for some unknown reason, probably from the lack of sufficient water. Nesmith's new mill is running steadily on ore from the Bobtail, obtaining good results. We did not have time to visit the other mills above and below Black Hawk, but understand that they are nearly all in full operation, and that their results are generally highly satisfactory."

New York.

NICKEL.

A mine, the ore of which carries a workable proportion of nickel has lately been opened on the banks of the Hudson river, some 43 miles north of this city at "Anthony's Nose. "The ore is taken to the landing a few miles above Peekskill and shipped to Newark, we believe, for treatment.

Nickel is not affectionately regarded as a material for coins. It is so hard and sharp that it breaks the dies with great frequency, to the annoyance of the people at the mint. But while it is likely to go out of employment in coinage, another new and extensive use for it has been established. Means have been lately found for so depositing it on metallic articles as to make a more lasting and a far cheaper coating than silver, and one quite equal to silver in beauty. The battery process has, indeed, for some years partially deposited nickel; but the new Adams invention, whose results are shown in the Institute Fair, deposits it now to any desired thickness—so attaining the success long aimed at. With so cheap a coating, taking as high a polish as silver, and less liable to tarnish, the uses of electro-plating are likely to spread a hundred-fold, and reach all metallic articles of ordinary use. "Pennsylvania and Connecticut both contain," says the New York *Times*, "very rich veins of nickel only partially worked, however, owing to the difficulty of separating the metal from the ore. English nickel can now be bought in this market at $1 25 (gold) per pound, and American nickel at about the same price. However, this new demand for nickel in electro-plating will doubtless encourage the opening of new mines in regions now neglected."

Idaho.

MINING IN BOISE COUNTY.

THE Boise City *Statesman*, Sept. 28, says: "A new quartz enterprise is in progress near Pioneer. Mr. I. T. Stobbard called at our office yesterday and presented us with some specimens of rich ore from the Duncan and Justitia ledges, situated near that place. He has just returned from building calcining furnaces and a cupel for smelting the rich sulphurets in those ledges. He informs us that the superintendent of the reduction works is an old and experienced smelter from the famous works at Swansea, in Wales. The machinery for the water power and blasts is under the supervision of Mr. Jones, a practical mill man of this territory. Mr. S. states that the superintendent, Mr. Phelps, predicts a great revolution in the reduction of rebellious ores, as all the materials necessary for erecting extensive smelting works are found in the immediate vicinity of the mines. The results of the above undertaking will be known in a few days, and if successful there will be from twenty to thirty cupels in full blast during the ensuing summer. Mr. Duncan deserves credit for his patience and perseverance in acquiring information respecting the working of these claims, and we hope that he is about to reap a rich harvest. Mr. S. says there are at least ten thousand tons of ore in sight, which assay from $179 to $2400 per ton. These are the first smelting works in Idaho."

Michigan.

THE Houghton *Gazette* reports the following copper products for September: "Hecla Mine stamps 375 tons; Calumet Mine stamps 250 tons; Franklin Mine, mass, barrel and stamp, 85 tons 527 lbs.; Pewabic Mine, mass, barrel and stamp, 53 tons 253 lbs.; Quincy Mine, stamp work, 140 tons 950 lbs."

A correspondent writing from Negaunee, Oct. 7, of the iron shipments, says: "Iron shipments have been rather light the past week, owing to the unfavorableness of the weather; mostly rain with an occasional snow squall.

"Five hundred tons of the Cascade ore, which has been mined and lying beside the track on Mineral Branch for several years, is being shipped to Escanaba, preparatory to transportation."

MARKET REVIEW.

The Coal Trade.

NEW YORK, Oct. 15, 1869.

ANTHRACITE COALS.

WHOLESALE.—The market has been moderately active during the past week on miscellaneous coals, such as Wyoming, McNeal and similar grades, at prices ranging from $6 00 to $7 50. Lehigh Coals are almost entirely out of the market, owing to a continued strike among the miners in the Lehigh District. We heard of one or two small lots of Honey Brook and Spring Mountain having been sold at $8 25@$8 50. Wilkesbarre Coal is in fair supply in all sizes except Lump, which is very scarce in all kinds—prices ranging from $6 50 to $7 50 at Hoboken. This is the only one of the Company Coals that is to be had. The Delaware and Hudson Company report that their canal will be in working order to-morrow (Oct. 16th), which, by the way, is one week earlier than it was anticipated; the damage done by the late storm could be repaired. They report "no coal for sale this month." The Delaware, Lackawanna and Western Railroad Company are busy filling orders on coal sold at last auction sale, and report "no coal for sale this month." The Pennsylvania Coal Company have notified the trade in a circular issued this day, that they are full of orders for all coal they can possibly deliver to the 20th inst. Our readers should now be able to draw conclusions as to the state of this market. We think the chances for many getting a supply of coal before the close of navigation, are very slim.

We have taken pleasure in noticing the successive improvements in the Pottsville *Miners' Journal*. Since our paper came into existence as the national organ of the coal trade, that enterprising local organ of the Schuylkill region has adopted many new features, in following our example. We were the first, for instance, to introduce quotations of *special coals;* to quote and arrange *prices* and *freights* as our contemporary now does; to give rates of transportation to tide-water in any shape; and in all these particulars the *Miners' Journal* has imitated this paper with great advantage to itself and its subscribers. On our part, we are glad to find, now and then, in its columns, local news of interest; and we consider it one of our best country exchanges. To be sure, there is a good deal of political trash in its e al department, which is of no use to us, or anybody else; but rural editors do not feel bound, perhaps, as metropolitan ones do, to keep politics out of commercial news. We might also prefer to find accurate figures every week in the *Miners' Journal*, instead of paragraphs like the following, which we clip from the last number, somewhat similar confessions having appeared in the last three numbers:

"An error was made in the coal table last week, by the person who corrected it of 30,000 tons. It is corrected this week."

But this is a small matter. If we desire to get exact returns from this source, we have only to stop our press for a week, till the *Miners' Journal* has corrected its tables. Not being a mere local paper, we are, however, unfortunately obliged to go to press promptly, and this prevents us from making any confident use of the figures of our contemporary.

Having thus heartily bestowed our praise, we must be allowed to indulge in a little mild reproof. The last number of the *Miners' Journal* assails our returns, and gives "samples of inaccuracies." We subjoin a sample of the samples:—

	Week.	Total.	Increase.
"Sept. 21	275,737	9,423,558	368,704
Sept. 28	304,830	9,536,489	237,198
Oct. 5	337,381	10.143,109	118,397

"Now, by deducting 9,423,558, for September 21, from 9,536,485, for September 28, it would give an increase of 112,931, and not 237,198. By deducting 9,536,489, for September 28, from 10,143,109, for October 5, it would give an increase of 606,611 tons, and not 118,397, as given in their table, making a difference in a week of 488,214 tons."

The figures with which this extract commences are quoted from the ENGINEERING AND MINING JOURNAL; and the third column is expressly said by us to contain the increase or decrease each week, *as compared with the same time last year*. Our rustic friend and pupil compares each week with the *week* before, instead of the *year* before—a distinction not without a difference. Couldn't "the person who corrects" the statements of the *Miners' Journal* be prevailed upon to correct this, in the course of a week or two? If he has a little arithmetic and a little honesty he will probably do so; and a little politeness would induce him to add a little apology.

RETAIL.—The retail trade has been very active, and dealers are rapidly getting rid of their stocks. Pittston Coal is selling at $8 00 for store, $7 00 for nut; Lackawanna at $8 50@$7 00; Scranton at $8 50@$6 50. Lehigh and best qualities Schuylkill, such as Diamond Vein and Locust Dale, $9 50 to $10 00.

FREIGHTS—Are unchanged. Vessels are in fair supply at from five to ten cents advance in some cases.

FOREIGN COALS.

Messrs. PARMELE BROTHERS report an active business doing in English and Provincial House Coals, for open grates. Prices range from $16 to $18 per 2000 lbs. delivered.

BOSTON AND PHILADELPHIA.

Our correspondents at these points report both the wholesale and retail trade as active. They especially note a demand for Egg, Store and Chestnut Coals, and there is a tendency to advance prices. Vessels are in ready supply, and freights are unchanged.

The following table exhibits the quantity of Coal passing over the following routes of transportation to tide-water, for the week ending October 9, 1869, compared with the same time last year:

COMPANIES.	1868. WEEK.	1868. TOTAL.	1869. WEEK.	1869. TOTAL.
Phila. & Reading R.R.	109,271	2,398,453	68,584	2,841,294
Schuylkill Canal	24,298	705,327	7,373	513,907
Lehigh Valley R. R.	53 470	1,849,307	9,410	1,672,221
Lehigh and Sus. R. R.	17,358	350,858	7,068	630,267
Lehigh Canal	35,342	726,754	1,310	564,030
Scranton North	17 303	458 764	16,823	285,044
" South	18,973	854,137	8,475	747,416
Penn. Coal Co., rail	19,521	713 329	15,029	754,790
" " " canal	332	2',547		14,658
Del. and Hudson, rail			2,746	108,274
" " canal, north	50,500	1,260,434	17,152	864,363
" " " south			5,765	74,552
Shamokin	12,505	385,631	14,531	329,498
Trevorton	1,362	20,961	1,234	24,886
Short Mountain	3,951	92,207	2,951	79,859
Lykens Valley Coal Co.	2,045	69,022	1,713	56,066
Huntingdon & Br'd Top	6,589	200,780	7,089	274,951
Wyoming South	13,593	250,493		224,659
" North	4,315	60,316	2,371	48,725
Williamstown, Col'y	5,812	138,510	030	157,171
Total	397,040	10,15 ,830	189,659	10,289,710
1869	189,659	10,289,710		
Decrease	207,381	269,120		

Report of Coal Transported over Lehigh Valley Railroad

For the week ending October 9, 1869, and previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	PREVI'Y. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Mahanoy	3,433 09	337,689 19	341,121 08
" Beaver Meadow	150 13	338,069 01	338,219 14
" Mauch Chunk		223 03	223 03
" Upper Lehigh		8,581 11	8,581 11
" Hazleton	2,349 05	683,157 02	685,516 07
" Wyoming	4,585 18	343,363 10	347,949 08
Total	10,525 05	1,711,084 06	1,721,613 11
To Lehigh & S. R. R., at P'n. Hav. for rail		4,406 16	4,406 16
Do. for canal		120,734 09	120,734 09
At Mauch Ch'k for canal		97,546 03	97,546, 03
Total Anthracite	10,529 05	1,933,771 17	1,944,300 19
Susquehanna Region Bit. Coal (Fall Creek)		552 03	552 03
Total by rail and canal	10,529 05	1,934,323 10	1,944,853 02
Same time last year	73,108 01	2,043,140 11	2,116,248 19
Increase			
Decrease	62,578 16	108,817 04	171,395 17
Forwarded East from M'h Chunk by rail	9,410 02	1,662,809 17	1,672,219 12
Same time last year	53,469 15	1,786,857 17	1,849,307 17
Increase			
Decrease	44,059 15	133,028 08	177,087 15

RECAPITULATION.

Forwarded East from M'h Chunk by rail	9,410 00	1,662,809 17	1,672,219 17
Delivered at M'h Chunk	15 09	718 03	733 12
Delivered on line of road above Mauch Chunk	223 04	6,426 06	6,649 10
Delivered above M. Chunk for use of L. V. R. R.	779 04	35,591 02	36,370 06
To N. C. R. R., at Mount Carmel		2,516 09	2,516 09
To L. & S. R R., at P'n Hav., for railroad		4,406 16	4,406 16
Do. for canal		120,734 09	120,734 09
Do. Packerton for rail	101 08	3,574 12	3,676 00
At M Chunk for canal		97,546 03	97,546 03
Total	10,529 06	1,934,323 17	1,944,853 02

Schuylkill Coal Trade.

Report of coal transported over the Schuylkill Canal for the week ending Thursday, October 7, 1869.

	Tons. Cwt.
From Port Carbon	1,637 00
" Pottsville	19 00
" Schuylkill Haven	5,193 10
" Port Clinton	524 00
Total for week	7,373 10
Previously this year	506,593 01
Total	513,966 11
To same time last year	705,327 09

Report of coal transported over the Philadelphia and Reading Railroad during the week ending Thursday, Oct. 7, 1869.

	Tons Cwt.
From St. Clair	29,577 09
" Port Carbon	6,702 04
" Pottsvil	2,504 09
" Schuylkill Haven	26,476 00
" Auburn	2,263 15
" Port Clinton	1,000 10
" E. P. R. R.	102 00
" Harrisburg and Dauphin	9,901 08
Total paying freight	78,587 15
Coal for Company's use	1,443 05
Total for week	80,031 00
Previously this year	3,210,231 03
Total	3,290,262 03
To same time last year	2,763,076 19

Lehigh Canal Coal Trade.

Shipped for the week Ending October 9, 1869.

WHERE FROM.	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Mauch Chunk Region	457 14	186,138 00
" Beaver Meadow "	268 06	93,927 18
" Mahanoy "		2,531 01
" Hazleton "	93 10	117,545 08
" Upper Lehigh "		5 142 07
" Wyoming "	470 16	178,745 11
Grand Total	1,310 06	584,030 05
Corresponding week last year	35,342 05	726,754 00
Increase		
Decrease	34,031 19	142,723 15

Lehigh and Susquehanna Railroad.

Report of Coal Shipped South for the week ending Oct. 9, 1869.

WHERE FROM WYOMING REGION.	WEEK. Tons. Cwt	TOTAL. Tons. Cwt.
Total Mauch Chunk Region	1,588 15	130,048 02
" Hazleton "	93 10	118,964 10
" Upper Lehigh "		77,193 12
" Wyoming "	5,950 16	599,736 10
Grand Total	7,633 01	925,942 14
Corresponding week last year	31,380 19	720,636 16
Increase		205,305 18
Decrease	23,747 18	
Forwarded South from Mauch Chunk	6,162 11	582,623 01
Delivered on line of Lehigh & Sus'na R. R., above Mauch Chunk	764 05	26,307 02
Delivered to Lackawanna & Bloom R. R., at Plymouth Bridge	141 19	16,185 19
Delivered to Lehigh Valley R. R. Co., at Sugar Notch		5,151 03
Delivered at Coal Port, for shipment by Canal	564 06	295,675 09
Total	7,633 01	925,942 14

Cumberland Coal Trade.

B. & O. RAILROAD.

The shipments over the Baltimore & Ohio Railroad for the week ending Oct. 9, 1869, were as follows:

From Cumberland & Pennsylvania R.R.	Tons.
Consolidation Co	2,451 02
Borden Co	1,263 02
Balt. & Hampshire Co	536 14
Midlothian Co	306 12
Cooke	68 05
From Eckhart R. R.	
C. C. & I. Co	2,236 01
Total	6,917 14

BY C. & O. CANAL.

For the week ending Oct. 9, 1869, the shipments by the Chesapeake & Ohio Canal were as follows:

	Tons.
American Co	2,704 05
Borden Co	2,173 08
Central Co	3,159 03
Consolidation Co	2,953 19
C. C. & I. Co	1,644 12
George's Creek Co	637 10
Hamp. & Baltimore Co	545 03
Midlothian Co	771 15
Maryland	1,425 17
For private parties	1,798 10
Total for week	17,831 02

Prices of Coal by the Cargo,

[CORRECTED WEEKLY.]

	AT NEW YORK, Oct. 15.		AT PHILADELPHIA, Oct. 13.	
SCHUYLKILL.	R. A.	W. A.	R. A.	W. A.
Lump	$— —	$6 50	— —	6 00 to 6 50
Steamer	— —	6 50	— —	6 00 to 6 50
Broken	— —	7 25	— —	6 00 to 6 50
Egg	— —	7 25	— —	6 00 to 6 50
Stove	— —	7 50	— —	6 50 to 6 50
Chestnut	— —	6 25	— —	6 00
Pea	— —	— —	— —	— —
LEHIGH.				
Lump	8 50	— —	7 50	— —
Steamer	8 00	— —	7 50	— —
Broken	7 75	— —	7 50	— —
Egg	7 75	— —	7 50	— —
Stove	7 75	— —	7 50	— —
Chestnut	6 25	— —	6 50	— —
Pea	— —	— —	5 25	— —
SPECIAL COALS.*	R. A.	8 50	— —	— —
Diamond Vein	"	— —	— —	— —
New England	W. A.	8 00	— —	— —
Locust Dale	" "	8 00 to 8 50	— —	— —
Honey Brook, Le'h R. A.	" "	8 00 to 8 50	— —	— —
Spring Mount.	" "	8 00 to 8 50	— —	— —
Sugar Creek	" "	8 00 to 8 50	— —	— —
Sugar Loaf	" "	8 00 to 8 50	— —	— —
Fulton	" "	8 00 to 8 50	— —	— —
Stout	" "	8 00 to 8 50	— —	— —
Old Comp'y's	" "	8 00 to 8 50	— —	— —
Cross Creek	" "	8 00 to 8 50	— —	— —
Chauncey	" "	— —	— —	— —
Girardville	" "	— —	— —	6 00 to 6 50
McMichael	" "	— —	— —	6 00 to 6 50
Duncan	" "	— —	6 50	7 00
Shamokin	" "	7 50	6 50	— —
Lykens Valley	" "	— —	8 00	— —
Broad Top	" "	— —	5 25	— —
Hill & Harris	" "	— —	6 50	6 75
Henry Clay	" "	— —	6 50	7 00
Powelton	" "	— —	6 50	— —
Burnside	" "	— —	7 00	— —

Kittaning Coal Co.'s Phœnix Vein... f.o.b. $5 50
" Lemon " 5 25
Cumberland C. & I. Co.'s on board 7 25
Central C. & M. Co.'s " 7 25
Consolidated Coal Co.'s " 7 25

[*Dealers in these coals may be found in our advertising columns.]

Company Coals.

	L.	Str.	Gra.	Eg.	Sto.	Cst.
Scranton at E. Port	6 00	6 25	6 75	7 00	7 50	6 00
Pittston at Newb'g	— —	— —	— —	— —	— —	— —
Lackawana at Rond't.	6 50	6 50	6 75	7 00	7 50	6 50
Wilk'b're at Hoboken.	6 50	6 50	6 75	7 00	7 50	6 00

For freights to different points, see "Freights."

Prices for Coal at Mauch Chunk.

	F.L.	Bro.	Gra.	Eg.	Sto.	Cst.
Lehigh	$4 25	$4 50	$4 50	$4 50	$4 75	$3 75
Wilkesbarre	4 25	4 50	4 50	4 50	4 75	3 75

For freight to Elizabethport and to New York see "Freights."

Prices of Foreign Coals.

September, 1869.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, New York.

Liverpool Gas Caking	$ 9 50@— —
" " Cannel	14 00@— —
" House "	17 50@18 00
" " Orrel	16 00@18 00
Per ton 2240 lbs., ex-ship.	
PRICES FROM YARD.	
Liverpool House Orrel, screened	$16 00@18 00
" " Cannel, "	17 00@20 00
Per ton 2000 lbs., delivered.	

Prices of Gas Coals.

September, 1869.

PROVINCIAL.

Duty, $1 25.	Coarse. Gold.	Slack. Gold.
Block House	$1 75	@- 75
Gowrie	1 75	@- 75
Lingan	1 75	@- 75
Sydney	2 13½	@- 71½
Pictou	2 13¾	@1 18¾
Little Glace Bay	1 50	@1 00
Caledonia	1 50	@- 75

AMERICAN.

	Coarse. Currency.	Slack. Currency.
Westmoreland Co	— —	@— —
Despard Coal Co	$8 50	@8 00
Penn	— —	@— —
Newburg Orrel Gas	— —	@— —
West Fairmount Gas Coal	— —	@8 00

AT PHILADELPHIA.

Powelton $7 80

Prices at Baltimore—SEPT. 1869.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$8 00@8 60
Pittston and Plymouth	7 75@8 45
Shamokin Red or White Ash	7 75@8 00
Lykens Valley Red Ash	7 75@7 80
Trevorton, Red Ash	7 25@7 50
By retail, per ton of 2240 lbs. delivered	9 00@9 75
Georges Creek & Cumberland f. o. b. at Locust Point for shipping	— —@5 00
West Fairmount Gas f. o. b.	— —@6 50

Prices at Georget'n, D.C., & Alexandria, Va.

September, 1869.

George's Creek and Cumberland f. o. b. for shipping..$4 75

Freights.—OCTOBER, 1869.

TO EASTERN PORTS.	From Philadelp'a.	From E. Port and Port Johnston.	From Newburg.	From Rondout.
Stamford	$2 00	$1 00	$1 20	$1 25
Norwalk	2 00	1 00	1 20	— —
Bridgeport	2 00	1 00	1 20	1 25
New Haven	2 00	1 00	1 20	1 25
Hartford	2 75	1 50	— —	1 75
New London	2 00	1 15	1 30	1 40
Norwich	2 00	1 20	1 40	1 50
Mystic	2 00	— —	1 35	— —
Stonington	2 00	— —	1 35	1 35
Sag Harbor	2 00	— —	1 35	— —
Bristol	2 00	1 30	1 45	1 45
Newport	2 00	1 50	1 45	1 45
Fall River	2 00	1 30	1 45	1 50
Providence	2 00	1 30	1 50	1 50
Dighton	— —	— —	1 50	— —
Warren	— —	— —	1 50	— —
Pawtucket	2 00	— —	1 65	1 65
New Bedford	2 00	1 25	— —	1 50
East Cambridge	2 50	— —	1 75	2 10
Salem	2 50	1 80	1 60	2 00
Newburyport	2 50	2 00	1 70	2 20
Portsmouth	2 50	1 60	1 65	2 10
Rockport	— —	— —	1 65	— —
Saco	2 75	1 75	1 60	1 75
Portland	2 50	1 60	1 60	— —
Bangor	2 50	— —	1 70	1 80
Bath	2 50	— —	1 80	— —
Middletown	— —	1 25	— —	— —
Amesbury	2 70	— —	— —	— —
Boston	2 50	1 80	1 60	2 00
Cambridgeport	2 50	— —	1 80	2 05
Taunton	2 50	1 55	— —	— —
Derby	2 00	1 15	— —	65
New York	1 55	60	— —	— —
Hackensack	1 75	— —	— —	— —
Jersey City	1 65	60	70	65
TO RIVER PORTS.				
Troy	1 75	95	60	65
Albany	1 75	1 00	55	50
Coeyman's	1 60	— —	55	50
Stuyvesant	1 50	— —	50	45
Cocksackie	1 60	— —	45	45
Hudson	— —	90	40	50
Catskill	— —	— —	40	35
Poughkeepsie	1 60	75	30	25
Fishkill	1 60	— —	20	30
Cold Spring	1 60	70	30	50
Haverstraw	— —	50	45	55
Nyack	1 60	50	55	50
Sing Sing	1 60	— —	60	50
Yonkers	— —	40	60	35
New York	1 55	50	70	— —
Saugerties	1 55	— —	35	30
Rhinebeck	1 60	— —	30	35
Rondout	1 60	60	30	25
Tarrrtown	1 60	80	60	— —
West Point	1 60	75	30	50

Prices at Havre de Grace, Md.

September, 1869.

Wilkesbarre and other White Ash for cargoes	$7 50@7 75
Lykens Valley	— —@7 75
Shamokin Red or White Ash	7 50@8 00
Trevorton and Zebra Valley	— —@7 50

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven	$2 50
From Port Carbon, 8 cents per ton more.	

TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Easton	$1 15
C. R. R., N. J., Easton to Elizabethport	1 70
Shipping expenses at Elizabethport	25
Total	$3 10

TO PORT JOHNSON.

L. V. R. R.	$1 15
C. R. R., of N. J.	1 70
Shipping expenses	25
Total	$3 10

TO HOBOKEN.

L. V. R. R.	$1 15
Morris & Essex R. R.	1 80
Shipping expenses	25
Total	$3 20

TO SOUTH AMBOY.

L. V. R. R.	$1 15
B. & D. R. R.	1 10
Cam. & Am. R. R.	50
Shipping Expenses	25
Total	$3 00

BY CANAL.

Via Schuylkill Canal.

TO PHILADELPHIA.

From Schuylkill Haven	$1 70
" Port Carbon	1 70
" Port Clinton	1 70

TO NEW YORK.

From Schuylkill Haven	$2 20

Via Lehigh Canal.

TO PHILADELPHIA.

Lehigh Canal	$1 14
Freight and towage	1 15
Total	$2 29

TO NEW YORK.

Lehigh Canal	$ 71
Morris "	85
Freight	1 70
Towing	10
Total	$3 36

TO JERSEY CITY.

Lehigh Canal	$ 71
Morris "	95
Freight	1 60
	3 25
For re-shipment	30
Total	$3 56

Via Delaware and Raritan Canal.

TO NEW YORK.

Lehigh Canal	$ 71
Delaware Division Canal	43
Delaware and Raritan Canal	57
Freight	1 45
Towage	50
Total	$3 36

TO NEW BRUNSWICK.

Lehigh Canal	$ 71
Delaware Division Canal	43
Delaware and Raritan Canal	57
Freight	1 20
Total	$2 91

For Re-shipment—30 extra for shipping, and 10 cents. drawback.

Foreign and Provincial Freights.

September, 1869.

Foreign.	
Newcastle and Ports on Tyne	£15@£18 keel
Liverpool	15s. 17s. ton.

TO NEW YORK.

Provincial.	
Sidney	$3 25
Lingan	3 25
Cow Bay	3 25
Port Caledonia	3 25
Little Glace Bay	3 25

TO BOSTON.

Sydney	$2 75
Lingan	3 75
Cow Bay	3 25
Port Caledonia	3 00
Little Glace Bay	2 25

Towing Rates.

TO EASTERN PORTS.

	Per Ton.
To New Haven	$ 40
Bridgeport	40
Southport	40
Westport	40
Norwalk	40
Stamford	40
	Per Boat.
Greenwich	$70 00
Port Chester	80 00
Mamaroneck	70 00
Glen Cove	55 00
New Rochelle	55 00
East Chester	60 00
West Chester	30 00
White Stone	30 00
College Point	25 00
West Farms	25 00
Flushing	30 00
Harlem and Mott Haven	20 00
Port Morris	20 00
Ninety-first street and Astoria	16 00

Boats beyond Port Chester, with less than 200 tons, $20 per Boat.

TO RIVER PORTS.

Boats of 150—250 Tons.	Per Ton.
To Manhattanville	9 cents.
Spuyten Duyvil	9 "
Yonkers	10 "
Hastings	12 "
Piermont	15 "
Dobbs' Ferry	15 "
Nyack	16 "
Tarrytown	17 "
Sing Sing	18 "
Croton Landing	19 "
Haverstraw	19 "
Verplanck's	20 "
Peekskill	20 "
West Point	21 "
Cold Spring	21 "
Newburgh	22 "
Poughkeepsie	22 "
Rondout	23 "
Boats of 100 Tons.	Per Boat.
To Manhattanville, and Return	$12 00
Spuyten Duvvil	14 00
Yonkers	15 00
Sing Sing	25 00
Peekskill	25 00

METALS.

IRON.—Duty: Bars, 1 to 1½ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¾ to 1¾ cents ₱ lb; Pig, 9 ₱ ton; Polished Sheet, 3 cents ₱ lb.

Pig, Scotch No. 1, ₱ ton		— —@42 —
Pig, American, No. 1		40 00@41 00
Pig, American, No. 2		38 —@39 —
Pig, American, Forge		36 —@— —
Bar, Refined, English and American		85 —@— —
Bar, Swedes, assorted sizes (gold)		82 50@87 50
		Store Prices.
Bar, Swedes, ord'y sizes, less 5 ₱ ct		— —@140 —
Bar, Refined	" "	95 —@100 —
Bar, Common	" "	87 50@ 90 —
Scroll	" "	120 —@180 —
Ovals and half-round	" "	120 —@145 —
Band	" "	120 —@— —
Horse Shoe	" "	120 —@— —
Rods, ¾ to 3-16 inch	" "	160 —@155 —
Hoop	" "	125 —@150 —
Nail rod, less 5 ₱ ct		— 8¼@— 9¼
Sheet, Russia, as to Nos. (gold)		— 11 @—12
Sheet, Single, D. and T. Common		— 5¼@— 7
Sheet, Galvanized		List 15@25 ₱ cent, discount,
Rails, English (gold), ₱ ton		— — @56 50
Rails, American, at Works in Pa		74 00 @76 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ℔ lb or under, 2½ cents: over 7 cents and not above 11, 3 cents ℔ lb; over 11 cents, 2½ cents ℔ lb, and 10 ℔ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ℔ lb		— 18	@— 22
English Spring (2d and 1st quality)		— 9	@— 11½
English Blister (2d and 1st quality)		— 11½	@— 19
English Machinery		— 12½	@— 15
English German (2d and 1st quality)		— 14	@— 16
American Blister "Black Diamond"		— 10½	@— 16
American, Cast, Tool	do.	— 19	@— —
American, Spring	do.	— 10	@— 13
American Machinery	do.	— —	@— 13
American German	do.	— 10	@— 13

COPPER.—Duty: Pig, Bar, and Ingot, 5 cents ℔ lb; Manufactured, 45 per cent. ad val.; old Copper

	All Cash.	
Copper, New Sheathing, ℔ lb	—	@— 32
Copper Bolts	—	@— 33
Copper Braziers, 16oz. and over	33	@— 35
Copper Nails	38	@— 40
Copper, Old Sheathing, &c., clean	20	@— 21
Copper, Chili Pig	—	@— —
Copper, American Ingot	22	@— 22½
Yellow Metal, New Sheating	—	@— 27
Yellow Metal Bolts	—	@— 27
Yellow Metal Nails	—	@— 27

LEAD.—Duty: Pig, $2 ℔ 100 lbs.; old Lead, 1½ cents ℔ lb; Pipe and Sheet, 2½ cents ℔ lb.

Galena, ℔ 100 lbs	$— —	@— —
Spanish (gold)	6 50	@6 62½
German, do.	6 50	@6 62½
English, do.	6 42½	@6 87½
Bar (net)	— —	@8 87½
Pipe and Sheet (net)	— —	@9 00

TIN.—Duty: Pig, Bars, and Blocks, 15 ℔ cent. ad val.; Plate and Sheets and Terne Plates, 25 ℔ cent. ad val.

	Gold ℔ lb.
Banca	38½@—
Straits	32½@32½
English	31¾@31¾

PLATES.

	Fair to Good Brands. Gold.	Currency.
I. C. Charcoal, ℔ box	$8 25 @8 50	$11 75 @12 00
I. C. Coke	6 75 @7 37½	9 75 @10 75
Coke Terne	— — @6 00	— — @ 8 50
Charcoal Terne	7 75 @8 25	11 25 @11 75

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ℔ 100 lb.

	Gold.
Plates, Foreign, ℔ 100 lbs.	$6 25 @6 30
Plates, Domestic, ℔ lb.	— 9 @— 12

REMARKS.

IRON.—The inquiry for Scotch Pig continues light, but full prices are obtained on all transactions, as holders, notwithstanding the large stock, refuse to sell at any concession on rates previously current; the sales are 300 tons Glengarnock at $38, and 120 do. Gartsherrie, ex ship, $40 50, cash. There is very little demand for American, but, with moderate offerings, prices are supported; we notice sales of 300 tons No. 1 Crane at $40; 100 do. No. 1 Allentown, delivered at Hoboken, $41; 300 do. Glendon Gray Forge, part delivered at Elizabethport, $37; and 200 do. Iron Ore, $6. There is a moderate inquiry for Wrought Scrap, and we notice sales of 600 tons from yard, on private terms. New Rails are in moderate request at steady prices. From store, Bar is in only moderate demand, at previous quotations. Russia Sheet is quiet—the ship, Geo. Kingman, which sailed from Cronstadt Sept. 16th, for New York, with 4000 pks. put back to Elsinore leaky, 23 days out.

STEEL.—Our quotations are unchanged, prices having been very uniform for a good while past.

TIN.—The month commenced with a large inquiry from the trade, and 7500 slabs Straits, part to arrive, were sold at 32c., 30 and 60 days. The price has since been nominally 32½c., at which the jobbers sell. English has been freely sold at 31½ to 31¾c. Banca 38c., all Gold. Importations in September, 5300 slabs Straits, 800 slabs Banca, and 120 tons English, the latter nearly all for dealers account. From the East Indies 8700 slabs Straits and 2500 slabs Billiton are on the way.

The stocks in first hands amount to ..... 5,560 slabs Straits.
No Banca or English ..... " "

Total in Boston and New York. 5,500 slabs.
Against.. 12,250 " on 1st Oct., '68
18,900 " " '67
27,600 " " '66

The Dutch Trading Co. sold on the 1st inst. in Amsterdam 61,000 slabs Banca, at fl 74; the price advanced after the sale to fl 76. Straits in London 128s., English 126s. By telegram from Singapore, dated middle of September, Tin was quoted $32 None shipping to the U. S.

SPELTER—Is unchanged in value. Silesian and Belgian are quoted 6¾c. gold, although several small parcels have been sold for a little less. Importations for September 350 tons. Stock 500 tons, against 200 tons on the 1st of October, 1868, and 1000 tons on the same date, 1867.

COPPER—Declined gradually during the first three weeks of September, from 23 to 22c. for both Lake and Baltimore; in some instances sales have been made at 21¾c. A good deal has been quietly sold for consumption, and to-day it is as difficult to buy at these rates as it is to sell. The stocks are not large for the season; the supply from Lake Superior will be fully equal to last year, but the Atlantic Smelters have produced very little, and this begins to tell upon the stocks. On the other hand manufacturers have bought freely, but if they are for the moment tolerably provided, the general impression is that the consumption of 1869 will show no falling off from that of 1868, and that they will have to buy again shortly. To-day (Thursday) the market is somewhat firmer, without large business. The London market is unchanged at £67 10s. for Chili Bars.

LEAD—Has been in steady demand for consumption, and with a decreasing stock the price is firm at 6¼c. gold for ordinary foreign, although parcels from ship are sold at a trifle less.

Importations in September. 1800 tons, and deliveries for consumption 2500 tons.
Stock on the 1st instant, 700 tons,
against 1900 " on 1st Oct, 1868.
2700 " " 1867.

MANGANESE.—Pembroke Oxide of Manganese, Lump, 4½c.; Powdered, 5c.

ZINC.—Dry American, 8@8½c.; French, 11¼@11½c.; Metallic, 12@12½c. Duty, 2½c. per lb.

REGULUS ANTIMONY—Is steady at 12½c. gold, with sales of 5 casks at this price.

SALTPETRE.—Refined, pure, 15½c. ℔ lb.; Crude, 7c. gold; Nitrate Soda, 4¼@4½c. gold.

London Weekly Metal Report.

LONDON, E. C., September 24, 1869.

THE Metal Market has been dull since our last report, and consumers and operators have been able to supply their wants at a slight reduction from previous quotations.

IRON.—The reports from Staffordshire and Wales continue satisfactory, orders to a fair extent having been given out. Scotch pig iron has slightly improved, the last price paid 53s. cash.

COPPER continues dull of sale. India sheets and sheathing £78; best and tough sell at very irregular prices. Chili bars are quieter, £67 10s. to £68 spot, and £69 forward. Australian: A little business has been done in Burra at £76. Wallaroo is held for £76 10s. to £77.

TIN.—Pending the present Banca sale (this day), there is but little doing. The market is quiet. Straits, £131 to £131 10s. cash; Banca nominally £135; Billiton, £132. The Dutch market is quiet, at 78½fl. to 79fl, English tin in good demand at full prices.

TIN PLATES do not show any improvement, though the accounts from New York are more favorable.

LEAD dull, with a tendency in buyers' favor.

SPELTER very dull. No sales reported. Common brands in London, £20 to £20 5s.; in outports £20; specials, £20 5s. to £20 7s. 6d.; English, German, and Belgian, £19 15s. to £20.

N. B.—DUTCH SALE.—All sold at 74fl., equal to £157 10s. in London.

VON DADELSZEN & NORTH.

Mining Stocks.

OUR table of Mining Stock quotations this week, appears without any change having been made in prices. The reason for this is, the business at the Exchange has been so small for several days past, that no reports of prices and sales have been issued.

We would be obliged to those companies whose names appear in our list, if they would send us on Thursday of every week, the market prices of their stocks. This would not only free us from dependence on the convenience of the manager of the Stock Exchange, but furnish to the public the prices of many stocks that do not appear in its lists.

San Francisco Stock Market.

SAN FRANCISCO, October 13, 1869.

	1st Board.	2d Board.
Savage	41	42¼
Crown Point	13	12½
Yellow Jacket	38½	37½
Kentucky	1 64	1 63
Chollar Potosi	15¼	14
Gould & Curry	70	68½
Ophir	20	17½
Alpha	No sales.	
Belcher	13	12¼
Imperial	32	31
Hale & Norcross	1 19	—

ASSESSMENT.—Empire Mill and Mining Company; payable immediately; $25 coin, per share. Delinquent Nov. 4th; sale Nov. 4th.

Attempts to make Norfolk a Great Atlantic Port.

There has for some time been a great struggle to divert a large portion of the Western grain trade from its present channel by the Lakes and the Erie Canal to Norfolk, and in order to achieve this desirable object, it is rumored that a bill will next session be submitted to Congress for the purpose of constructing a canal through the Virginia mountains to the Chesapeake, and thus reach the port of Norfolk by the Kanawha Canal and the James River. This route will entail 400 miles of canal to complete the communications, but this would open a way for transportation without trans-shipment, and would also form a joint communication of 17,000 miles of inland navigable waters. It would also be a more faithful channel than that of the Lakes and the Hudson, which are generally closed five months in the year.

Much is said of this new route as one both of facility and cheapness; but we greatly question if it would succeed in diverting much of the grain trade from New York. Why should the 400 miles of mountain cutting be performed upon such terms that the grain of the West could be borne along the canal at a cheaper rate than along the 300 miles of Erie Canal? There is an advantage in winter transit that we cannot gainsay; but we have no hesitation in saying that the grain passing through the fiery Southern States in summer would scarcely reach New York or Europe without being soured by heating.

There can be no possible objection to this great emulatory commercial competition; but as the Erie Canal was a State and not a national enterprise, we think that neither Carolina nor Virginia should expect the nation to supply the funds for such an undertaking.—*Insurance Journal.*

The Slate Quarries of Cornwall.

MR. ROBERT HUNT estimates the annual production of the slate quarries at Delabole, near Camelford, England, at about 17,050 tons a year, which, at say $16 a ton, would realize over $275,000 annually. The Devonshire slate quarries he estimates to produce 15,000 tons a year, value say $240,000 annually. Most of the Cornish slab is shipped either at Boscastle or Port Gavern, in Endellion.

Steam on the Suez Canal.

A STEAMER ran through the Suez canal, from Port Said to Suez, recently, in fifteen hours. Galileo was right—"The world goes round."

MINING COMPANIES AND STOCK QUOTATIONS.

GOLD AND SILVER COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Alameda Silver		A. Queran, 108 Wall st.	$2,000,000	$10 00		
Ada Elmore	South Boise, Idaho					
American Flag	Nevada District, Col.	P. P. Fullerton, 71 B'way.	600,000	10 00		
Atlantic and Pacific	Humboldt Co., Nevada.					
Bates and Baxter	Colorado			50 00		
Benton	Colorado	W. F. Drake, 15 Broad	500,000	5 00		
Briggs	Colorado	J. P. Davies, 19 Cliff	1,000,000	100 00		
Black Hawk	Colorado	C. T. Whittington, 48 Broad	2,500,000	100 00		
Bobtail	Colorado	J. Stanton, Jr., 25 Nassau	1,000,000			
Bullion Consolid'ed Gold	Colorado					
Burroughs Gold	Colorado					
Church Union Gold	California					
Consolidated Gregory	Colorado				1 3⁸	1 60
Combination Silver	Nevada			100 00		
Columbia Silver	Austin, Nevada	J. M. Brown, 155 B'way	5 000,000			
Commercial Silver		J. E. Smith, 26 Pine	3,000,000			
Corydon	Gilpin Co., Colorado	J. Samuels, 40 B'way	500,000			
Downieville	Colorado		2,500,000	25 00		
Eagle Gold	Gold Dirt Dist., Col.	J. P. Davies, 19 Cliff	300,000	1 00		
Empire Gold and Silver	BodieBluff, MonoCo. Cal	H. K. Gates, 70 B'way	1,000,000			
Edgehill		A. Fullerton, 71 B'way	10,000,000			
Esperanza Silver		Ezra Clark, Jr., 13 William	400,000			
Fisk Gold		H. Johnson, 195 Fulton	500,000			
Forest Queen		E. B. Beet, 62 B'way	1,000,000			
Golconda Gold	Sherbrooke, C. E.	H. Adams, 71 Broadway	2,000,000			
Gregory	Colorado		1,250,000			
Gunnell Gold	Colorado	J. H. Rolston, 80 B'way	1,000,000	50 00		50
Gunnell Central	Colorado	C. B. Bostwick, 16 B'way	3,000,000	10 00		
Gold Rock		R. M. Lockwood, 93 Wall	400,000			
Great Western Gold		C. B. Bostwick, 16 B'way	200,000			
International Silver		J. W. Brazier, 26 Pine	600,000			
Hope Gold	Colorado		5,000,000			
Holman			2,000,000	25 00		
Kipp & Buell	Colorado		300,000			
Knickerbocker Gold		J. H. Rolston, 80 B'way	200,000	100 00		
La Crosse Gold	Nevada Dist., Col.	P. P. Fullerton, 71 B'way	1,000,000		10	20
Lander Hill T. & S.	Nevada	M. L. Catherwood, 74 B'way	1,000,000			
Lewis Gold	Georgia		1,000,000			
Liberty Gold						
Manhattan Silver	Nevada	M. L. Ogden	400,000			
Maraposa common	California	Jas. H. Ferdon, 34 Wall	12,000,000		9½	10
Mariposa preferred	California	do. do.			17½	18
Montana Gold		G. De Cordova	400,000		5	14
Montana M. L. & M. Co.	Montana	A. M. Hoyt, 22 William	250,000			
Montrose	Clear Creek Co., Cal.	W. W. Perkins, 71 B'way	1,000,000			
New York Silver	Nevada	Thos. Sproull, 78 B'way	1,500,000			
New York and Austin	Nevada	E. R. Siccomb, 70 Wall	500,000			
New York and Owyhee	Owyhee Co., Idaho		1,000,000			
New York and Eldorado		G. H. Munroe, 10 Wall	2,000,000			
N. Y. & Montana M. & D.	Montana	F. A. Chapman, 20 Nassau	1,250,000			
N. Y. & Silver Peach	Nevada	R. C. Root, 74 B'way	2,000,000			
N. Y. & Utah P. & M.		W. H. Mailler, 108 Wall				
Ophir Gold	Comstock Lode, Nev.	L. C. Warner, 70 B'way	625,000			
Owyhee Gold		W. H. Smith, 43 Ex. Place	1,500,000			
Pahranagat Central	Nevada	J. E. Smith, 25 Pine	6,000,000			
Quartz Hill Gold		F. Bernard	2,500,000		90	1 00
Reese River Consol'd	Nevada	W. B. Ogden	6,000,000			
Rocky Mountain	Colorado	S. M. Pond, 70 B'way	500,000	10 00		
Rollins Gold		Thos. Bond, 132 B'way	600,000			
Sensenderfer	Colorado	H. A. Shewill, 19 Broad	1,000,000			
Silver Bend		F. W. Macy, 20 Nassau	1,500,000			
Silver Mt. Silver		H. A. Moen, 71 B'way	1,000,000			
Silver Peak & R. M.	Nevada	W. B. Ogden, 52 Wall	5,000,000			
Smith & Parmelee	Colorado	W. H. Hollister, 6 Broad	2,500,000	20 00	1 75	1 90
Social & Steptoe Con.		T. H. O'Connor, 24 Nassau	450,000			
Standard Gold		C. B. Bostwick, 169 B'way	500,000			
Stephenson Silver		A. S. Kellogg, 22 Pine	1,000,000			
Twin River Silver	Nevada	J. F. R. Hadden, 20 Nassau	800,000	100 00		
Texas Gold	Colorado		500,000	10 00		
Union Gold	Colorado	F. A. Potts, 110 B'way	1,200,000			
Wash. Mill & Silver	Nevada	W. W. Perkins, 71 B'way	300,000			
Wauba Yuma	Arizona	J. W. Sisby, 36 Pine	6,000,000			

COAL AND IRON COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Coal Co.		M. A. Myers, 119 B'way	$1,500,000	$25 00		
Ashburton Coal Co.		J. T. Rollins, 41 Pine	2,500,000			
Block House Coal		D. B. Keeler, Jr., 43 Pine	1,000,000			
Brewster Iron		H. Robison, 165 B'way	150,000			
Broad Top Coal & Iron Co.	Pennsylvania	B. Love	2,000,000			
Cameron Coal Co.		J. A. Simpson, 40 B'way	2,500,000			
Carbon Hill Coal Co.		J. Silsby, 36 Pine	1,000,000			
Central Coal		F. P. White, 111 B'way	2,000,000	100 00	60	65
Clifton Iron Co		P. H. Riordan, 34 Pine	1,250,000			
Columbia Iron		E. D. Webb, 77 Cedar	1,000,000			
Consolidation Coal	Maryland	J. S. Mackie, 71 B'way	5,000,000			
Crawford Coal		E. Clapp, Prest, 137 B'way	1,000,000			
Cumberland C. & I. Co.		E. Kisean, 90 B'way	5,000,000		25	
Derby Coal Co.		W. S. Davison, 11 Broad				
Dover Coal and Iron Co.		L. Chase, 88 Wall				
Del. & Hudson Canal Co.			10,000,000	100 00		1 21
Ebervale Coal		G. L. Stout, Treas., 111 Br'y	500,000			
Fall River Bituminous		D. T. Blauvelt, 43 Pine	1,000,000			
Farrar Coal		C. H. Jones, 43 Pine	250,000			
Fisher Iron Co.		M. Ellis, 19 William	100,000			
Hamp're & Balt. Coal		S. M. Pond, 70 B'way	500,000			
Iron Cliffs Co.		C. J. Canda, 52 Wall	1,000,000			
Jackson Iron		G. P. Loyd, 119 B'way	300,000			
Kemble Coal & I. Co.		R. A. Wight, 26 Ex. Place	300,000			
Keokuk Coal		J. F. Franklin, 112 B'way	100,000			
Lackawanna I. & C.	Pennsylvania	E. C. Lynde, 52 Wall	1,200,000			
Lewis Run C. & I. Co.		C. A. Sanborn, 80 B'way	750,000			
Lykens Val. Coal Co.		F. A. Platt, 13 William	800,000			
McKean Co. Bit. Coal Co.		J. H. Rolston, 80 B'way	1,000,000			
Lehigh & Susquehanna						
Mahanoy			400,000	100 00		
McNeal C. & I. Co.		C. C. Godwin, 71 B'way	500,000			
Mount Riga Iron		G. M. Newton, 42 Cedar	300,000			
New Boston Coal		C. H. Ogden, 55 B'way	2,000,000			
N. Y. Con. C. & I. Co.		A. T. Levine, 16 Wall				
N. Y. & Lehigh Coal		T. Simpson, 111 B'way	150,000			
Pacific Coal Co.		G. Wrighton, 34 Wall				
Peekskill Iron Co.		W. Murdock, 7 Nassau				
Pennsylvania Coal Co.		C. H. Mead, 111 B'way	3,200,000	50 00		
Richmond Iron Co.		C. H. Smith, 165 B'way	1,000,000			
Scotia Coal Co.		I. N. Soper, 42 B'way	2,500,000			
Spring Mt. Coal		C. Runyon, 111 B'way	1,250,000			
Springfield & D'p Run C.		E. D. Webb, 77 Cedar	600,000			
Stout Coal Co		G. S. Comstock, 111 B'way	500,000			
Susquehanna & Wyoming		E. Potter, 40 B'way	1,000,000			
Tannerdale Coal		I. T. Ludlow, 71 B'way	250,000			
Wash. Mutual Coal		M. C. Baker, 117 B'way	420,000			
West Point Iron Co.		R. C. Brock, 110 B'way	500,000			
Wilkesbarre C. & I. Co.		W. H. Tillinghast, 80 Br'y	3,400,000			
Wyoming Val. Coal Co.		E. Potter, 40 B'way	1,000,000			

COPPER AND LEAD COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Anita Copper	California	J. A. Ferguson, 8 Wall				
Corinth Copper	Corinth, Vermont	S. H. Howard, 191 B'way	$500,000	25 00		
Davidson Copper						
Eagle Harbor Copper	Michigan	W. H. Smith, 43 Ex. Place	500,000	25 00		
Evergreen Bluff Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000	25 00		
Globe Copper		R. K. Rickard, 19 Nassau	200,000			
Grand Portage Copper Co		A. S. Kellogg, 22 Pine	500,000			
Guymard Lead		Samuel Vernor, 38 Pine				
Hilton Copper		W. H. Smith, 43 Ex. Place	500,000			
Hope Copper		J. W. Davis, 19 Nassau	500,000			
Hudson River Copper	New York	T. Clarkson, 22 William	1,500,000			
Indiana Copper Co.		J. M. Mills, 25 Nassau	500,000			
Isle Royale Copper	Michigan	F. W. Caper, 44 Ex. Place	1,000,000			
Keweenaw Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000			
Lake Superi'r Silver Lead	Michigan	A. S. Kellogg, 22 Pine	1,000,000			
Omiga Copper	Michigan	S. Cooper, 7 Pine	500,000			
Ridge Copper	Michigan	J. L. Gardiner, Jr., 43 Ex. P.	500,000			
Rockland Copper	Michigan	A. Fullerton, 71 B'way	500,000			
St. Joseph Lead	Michigan	J. W. Jones, 6 Broad st,	1,000 000			
St. Marguret Copper		E. P. Sutton, 43 Pine	250,000			
Schoolcraft Copper		R. Walsh, 22 William	500,000			
Superior Copper	Michigan	A. Fullerton, 71 B'way	500,000			
Union Copper		A. S. Kellogg, 22 Pine	500,000			
Vermont Copper	Vermont	J. C. Ely, 191 B'way	500,000			
Wallkill Lead, ass'td		S. M. Pond, 70 B'way			12	17

MISCELLANEOUS.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Zinc Co.		W. E. Lawton, 19 Cliff	$1,000,000			
Bigelow Blue Stone Co.		H. Bogardus, 14 Pine				
Clough Stone Co.		C. P. Williams, 50 Beekman	500,000			
Covil B. L. M. & M'f. Co		C. R. Bostwick, 302 Pearl	250,000			
Manhattan Marble		H. K. Gates, 70 B'way	300,000			
N. Jersey Zinc Co.	New Jersey	A. H. Farlin, 61 Maiden L'e	1,500,000			

Mechanical Science.

MR. C. W. SIEMENS, the inventor of the Regenerative Gas Furnace, and President of the Mechanical Section of the British Scientific Association, in his recent inaugural address, said: "While science and mechanical skill are combined to produce such wondrous results, the germs of further and still greater achievements are matured in our mechanical workshops, in our forges and in our metallurgical smelting-works. Here a great revolution of our constructive art has been prepared by the production, in large quantities and at moderate cost, of a material of more than twice the strength of iron, which, instead of being fibrous, has its full strength in every direction, and which can be modulated to every degree of ductility, approaching the hardness of the diamond on the one hand, and the proverbial toughness of leather on the other. To call this material cast-steel seems to attribute to it brittleness and uncertainty of temper, which, however, are not its necessary characteristics. This new material, as prepared for constructive purposes, may indeed be both hard and tough, as is illustrated by the hard steel rope that has so materially contributed to the practical success of steam ploughing. Machinery-steel has gradually come into use since about 1850, when Krupp (of Essen) commenced to supply large ingots, that were shaped into railway tyres, axles, cannon, etc., by melting steel in halls containing hundreds of melting crucibles. The Bessemer process, in dispensing with the process of puddling, and in utilizing the carbon contained in the pig-iron, to effect the fusion of the final metal, has given a vast extension to the application of cast-steel for railway bars, tyres, boiler plates, etc. This process is limited, however, in its application, to superior brands of pig-iron, containing much carbon and no sulphur or phosphorus, which latter impurities are so destructive to the qualities of steel. The puddling process has still to be resorted to, unless the process of decarburization by Mr. Heaton takes its place, to purify those inferior pig-irons which constitute the bulk of our production; and the puddled iron cannot be brought to the condition of cast-steel except through the process of fusion. This fusion is accomplished successfully in masses of from three to five tons, on the open bed of a regenerative gas furnace, at the Landore Siemens steel works, and at other places. At the same works cast-steel is also produced, to a limited extent as yet, from iron ore, which being operated upon in large masses, is reduced to the metallic state and liquified by the aid of a certain proportion of pig metal. The regenerative gas furnace, the application of which to glass houses, to forges, etc., has made considerable progress, is well suited for these operations, because it combines an intensity of heat, limited only by the point of fusion of the most refractory material, with extreme mildness of draught, and chemical neutrality of flame. These and other processes of recent origin, tend towards the production, at a comparatively cheap rate, of a high class material, that must supersede iron for almost all structural purposes. As yet, engineers hesitate, and very properly so, to construct their bridges, their vessels, and their rolling stock of the material produced by these processes, because no exhaustive experiments have been published as yet, fixing the limit to which they may safely be loaded in extension, in compression, and in torsion, and because, as yet, no sufficient information has been obtained regarding the tests by which their quality can best be ascertained. This want is in the way of being supplied by the experimental researches that have been carried on for some time at the dockyard sat Woolwich. The results of Mr. Whitworth's experiments tending to render the hammer and the rolls obsolete by forcing cast-steel, while in a semi-fluid state, into strong iron moulds by hydraulic pressure, are looked upon with great interest. But, assuming that the new building material has been reduced to the utmost degree of uniformity and cheapness, and that its limits of strength are ascertained, there remains still the task for the civil and mechanical engineer to prepare designs suitable for the development of its peculiar qualities. In constructing works in foreign parts the reduced cost of carriage furnishes also a powerful argument in favor of the stronger material, although its first cost per ton might largely exceed that of iron. The inquiries of the Royal Commission into the extent and management of our coal fields appear to be reassuring as regards the danger of their becoming soon exhausted. Nevertheless, the importance of economizing these precious deposits in the production of steam power, in metallurgical operations, and in domestic use, can hardly be over-estimated. The calorific power residing in a pound of coal, of a given analysis, can now be accurately expressed in units of heat, which, again, are represented by equivalent units of force or of chemical action; therefore, if we ascertain the consumption of coal of a steam engine or of a furnace employed in metallurgical operations, we are able to tell, by the light of physical science, what proportion of the heat of combustion is utilized and what proportion is lost. Having arrived at this point, we can also trace the channels through which loss takes place, and in diminishing these by judicious improvement we shall more and more approach those standards of ultimate perfection which we can never reach, but which we should nevertheless keep steadfastly before our eyes. Thus, a pound of ordinary coal is capable of producing 12,000 (Fahrenheit) units of heat, which equal 2,240,000 foot-lbs. or units of force, whereas the very best performances of our pumping engines do not exceed the limit of 1,000,000 foot-lbs. of force per pound of coal consumed. In like manner 1 lb. of coal should be capable of heating 33 lbs. of iron to the welding point, (of say 3,000° Fahrenheit) whereas, in ordinary furnaces, not 2 lbs. of iron are so heated with 1 lb. of coal. These figures show the field for further improvement that lies yet before us. Although heat may be said to be the moving principle by which all things in nature are accomplished, an excess of it is not only hurtful to some of our processes, such as brewing, and destructive to our nutriments, but to those living in hot climates or sitting in crowded room, an excess of temperature is as great a source of discomfort as excessive cold can be. Why, then, should we not resort to refrigeration in summer as well as to calorification in winter, if it can be shown that the one can be done at nearly the same cost as the other? So long as we rely for refrigeration upon our ice cellars, or upon importation of ice from distant parts, we shall have to look upon refrigeration as a costly luxury only; but the President expresses his belief that by the use of properly constructed machines, it will be possible to produce refrigeration at an extremely moderate expenditure of fuel and labor, A machine has already been constructed capable of producing 9 lbs. of ice (or its equivalent) for 1 lb. of coal, whereas the equivalent values of positive heat developed in the combustion of 1 lb. of coal, and of negative heat residing in 1 lb. of ice, is about as 12,000 to 170, or as 70 to 1. This result justifies the employment of refrigerating machines upon a large scale; but it is hard to say what results may yet be reached with an improved machine on strictly dynamical principles, because such a machine seems not tied in its results to any definite theoretical limits. In changing, for example, a pound of water from the liquid into the gaseous state, a given number of units of heat are required, that may be produced by combustion of coal or by the expenditure of force; but in changing the same pound of water into ice, heat is not lost but gained in the operation, which heat must be traceable to another part of the machine, either as sensible heat or as developed force."

The Straits of Magellan.

THE whole distance through the Straits of Magellan is about 300 miles, and the width of the passage varies from 2 miles to 15 or 20. The eastern and western portions are strongly contrasted in scenery and climate; on the east we have low prairie land, perfectly bare of trees, with a clear, bright sky and hard, fresh wind; on the west rise, almost perpendicularly from the sea, lofty mountains clothed with the evergreen beech, which produce torrents of rain, varied by hail and snow in their seasons. From the western end of the Strait is a passage leading northward among numberless islands for 360 miles, and ending in the Gulf of Peñas. In this part it is scarcely too much to say that the rain never ceases for 24 hours together; the channel is much narrower than the Straits, and lofty mountains close it on each side so that the sun scarcely ever penetrates into its recesses. During the recent naval survey in which Captain Mayne was engaged, the ship's crew passed three months without being once able to dry their clothes except by the engine fires. When, however, the mists do clear away from the mountain tops, the scenery is grand beyond description. Dreary as is this passage, it is of great commercial importance, enabling the largest steam vessels to get northward to finer latitudes without encountering the high seas of the open Pacific, and to reach Valparaiso without the strain to the ship and machinery which the outer passage so frequently involves. Between the date when the celebrated survey of the Beagle under Captain Fitz Roy terminated, in 1836, and the present day, a new era has commenced in the navigation of the southern extremity of America. All vessels of war and a great proportion of merchant vessels are now steamers, and the Straits of Magellan offer immense advantages to them over the stormy passage round Cape Horn. Many vessels which now pass into the Pacific are 300 to 400 feet long, drawing 25 or 26 feet of water; the surveys of 30 or 40 years ago, therefore, which provided only for vessels 100 feet in length, drawing 14 or 15 feet of water, were no longer applicable. In those days, moreover, harbors were sought for and surveyed, into and out of which vessels could work under sail; with the monster steamers of the present day such harbors are not required, and the recent survey had to provide for the new conditions of navigation. In 1867 Captain Mayne went through the Straits in H. M. S. Zealous, an iron-clad of 4,000 tons, and in that year 38 steamers, in all, passed. At the present time, a monthly line of large steamers runs from Liverpool to Valparaiso by this route, accomplishing the distance in 42 days, or quicker than the overland route *via* Panama. The work of the survey, which Captain Mayne commanded, in the Nassau, commenced in December, 1866, and ended last May. The surveying parties frequently met with Patagonians in the eastern part of the Straits. They were clad in their usual long robes of guanaco skins, which make them look so much taller than they really are. Their chief, Casimiro, spoke Spanish, and at the first meeting requested the Captain to give him two bottles of rum, not, as he explained, for the tribe, but as a gift from chief to chief. Captain Mayne took the trouble to measure several of the men; he found one who was 6 feet 10¼ inches high, and several reached 6 feet 4 inches, but the average of those met with was 5 feet 10 inches or 5 feet 11 inches, which is some 4 or 5 inches taller than the middle height of Englishmen. The women are nearly as tall in proportion. Tall as the Patagonians are, their costume adds greatly to their apparent size; their robes of guanaco skin being as deceptive an addition to their stature as a woman's dress would be to a man of our own race. Their habit of standing on the cliffs beside their diminutive houses, to gaze on passing ships, further explains the exaggerated accounts of the early voyagers.

The Patagonians are entirely confined to the eastern portion of the Straits, never going farther west than the Chilian settlement of Punta Arena; they have no canoes, and much dislike going afloat. Wonderful is the difference between them and the natives of the mountainous and wooded country further west, and even those of the eastern part of the southern islands. from whom they are separated only by a narrow strait. These are the Fuegians; those of this race who live on the east being finer physically than their western relatives, probably owing to a more abundant diet of guanaco meat; but both sections, unlike the Patagonians, are untrustworthy. The western Fuegians extend even up the western channels, and inhabit both sides of the Strait. They differ in almost every respect from the Patagonians, being usually small, badly shaped, and ugly in features; but they have one advantage in their dislike of wine and spirits. Captain Mayne often tried them and could never get them to taste a second time, whereas any Patagonian would drink as much as he could get. Among the ethnological points the expedition was asked to notice, was whether these people ever smiled? Not only did they frequently smile, but they laughed outright whenever anything amused them. But mimicking was their peculiar *forte;* they would repeat whatever was said to them, and hum tunes after the men, though whistling rather bothered them. They were much amused at the officers walking up and down the deck two and two, and frequently joined hands and walked after them looking over their shoulders to hit the right time of turning. Sometimes their mimickry was rather annoying, as when they repeated the remark, "Why have not these people left the ship?" at times when they had staid too long aboard. The new Chilian settlement in the Straits, at Punta Arena, now numbers 800 souls, and signs of civilization are rapidly rising around it. Coal having been found in the neighborhood, it promises soon to become a coaling station for steamers, and will take away all trade from the Falkland Islands, which lie too far to windward of the Straits to be of importance in the new era of navigation of the Cape, which has now set in. During the survey the Nassau entered a small bay in an island called Sta-Magdalena, twelve miles from Punta Arena, which had never before been visited. The vessel was immediately surrounded by hundreds of seals, plunging about the ship in the utmost astonishment at this invasion of their haunts, and the cliffs were covered with thousands of penguins looking on in an absurdly sedate manner. None of these and other animals which swarmed around the bay were afraid of the approach of man, whom they had not yet learned to consider as their enemy, and the penguins in particular, when the cliffs were climbed, swarmed round and attempted to peck the legs of their visitors.

Salt Water on the Streets.

A day or two ago, the details of the plan of using river water for extinguishing fires and cleansing the streets, was submitted to the Board of Health by its engineer. The plan, which was first alluded to in the *Times*, is somewhat as follows:

The engineer proposes to divide the city into two districts, the first extending from the Battery to Fourteenth street; the second from Fourteenth to Fifty-ninth street. In the first district it is proposed to construct a large water-tank, or tower, 150 feet high, with mains extending over the district. A forcing pump is to be located some short distance from the tank, with a pipe running into the middle of the river. The mains and arteries having been filled, the water would be caused to ascend in the tower to a height of nearly 150 feet, when the pump would cease action. On the water diminishing in the tank, it would at once cause the pump to work and refill the vacuum. On the occurrence of a fire in any locality the pipes could at once be attached to the main in the street, securing a plentiful supply of water, capable of being directed to a height of 150 feet. Another important feature of the method is its utility in cleansing and flooding the streets. A constant and unfailing supply of salt water would always be on hand, and the mains being turned on, four or five men could in a very short time clean and flood four or five blocks. It is proposed to do this early in the morning and late in the evening, when all traffic in the street is suspended. In the second district it is proposed to erect a tower 100 feet high in the vacant inclosure adjoining the reservoir on Murray Hill. It is also proposed to erect a second tower to be filled with fresh water. The inhabitants complain that no water can be obtained either on the third or fourth story of their dwellings. This second tower will force the water to any height in any dwelling. The estimated cost, in round numbers for each district, is $2,000,000, and the working expenses per annum for both districts will not exceed $78,000. The engineer suggests that the men engaged in flushing the streets could also be engaged as firemen.

A New Scietific School-Journal.

THE POLYTECHNIC, a semi-monthly paper, devoted to the interests of polytechnic and scientific schools, and a record and review of civil, mechanical and mining engineering and general college news, published by Mr. MONTAGUE L. MARKS, editor and proprietor, at Troy, comes to us already, in its second number, enlarged from twelve to sixteen pages. The first number contained an admirable article on "Greek *vs.* Algebra," in which the prevalent deficiency of scientific men in logic and rhetoric was sharply and wisely criticised. The writer speaks of a certain scientific school which "turns out first-rate engineers, but nothing more. Not one in five knows how to use his own language correctly." The name of the institution is not given; but unfortunately the remark is almost universally true. This protest against the present fashionable *furore* for exclusive "scientific education" is timely and just. The typographical appearance of the *Polytechnic* is very beautiful, and we hope it will receive the support it is evidently intended to deserve.

To Unite Water Pipes.

AN excellent material for uniting water pipes is prepared by combining four parts of good Portland cement and one part of unslaked lime, mixed together in small portions in a stout mortar, adding enough water to permit it to be reduced to a soft paste. Pipes thus united have been in use more than six years without any leak.

THE ENGINEERING AND MINING JOURNAL.

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ROSSITER W. RAYMOND, Ph. D., Editor,

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THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.*

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P. O. Box. 5969.

To Whom it may Concern.

The United States Commissioner of Mining, having returned from his annual tour in the Pacific States and Territories, desires all letters and reports intended for him, to be addressed hereafter to this office. Mr. RAYMOND takes this opportunity to return very hearty thanks for the great courtesy with which he has everywhere been received, and the kind assistance which has been rendered him in the discharge of his official duties. These services will be further acknowledged in his forthcoming report.

The Commissioner, in holding at the same time the relation of Editor to this Journal, has at command a convenient means of communicating, in an unofficial way, to that portion of the public concerned, such explanations of his course as innocent misunderstandings seem to necessitate. Caring more for the confidence and support of the mining community than for his own official dignity, he will continue hereafter, as heretofore, to illustrate and defend in these columns the measures he has recommended and the steps he has taken as Commissioner. At the same time, he does not feel called upon to notice, either editorially or officially, all attacks of those who are impelled by that infesting curse of Western journalism—the desire to "pitch into" somebody. Personal enemies, so far as he knows, he hath none; and these Pickwickian assaults mean as little to him as they do to their perpetrators.

As the readers of the JOURNAL are aware, the Commissioner visited Colorado in the early part of the summer, and made arrangements for including that Territory in his report, though, lying mostly to the east of the Rocky Mountains, it is not strictly within his field of labor. It was a purely voluntary service on his part, and the severity with which one of the Colorado papers criticised his well-meant endeavors was a little more than Pickwickian, and a little less than decent. It gives him pleasure to acknowledge the prompt and hearty support which he received on that occasion from the remainder of the press, and the private assurances of approval which have reached him from the people.

More recently, the *New Northwest*, a paper published at Deer Lodge, Montana, complains of the treatment that Territory has received, as follows:

"We might as well state, just here, that the Mining Commissioners have been systematically bilking Montana. The Government is paying from $10,000 to $40,000 per annum for the preparation of these Reports—appropriating sums sufficient to enable the Commissioners to visit each State and Territory whereon they report. What has been the result? Mr. Taylor never visited Montana; Mr. Langford furnished the statistics which were cut down without shadow of reason, and Taylor pocketed the appropriation. Mr. J. Ross Browne had some $30,000 or $40,000 appropriated for the same purpose. He never visited Montana. He sent Dr. Blatchley on a flying trip through the Territory, as the darkey went through college, and left Professor Keyes to make the Report. Keyes gave the best geological report of the Territory ever written, but it was not Browne's fault. Then Mr. Raymond was appointed last year. He traveled over the Pacific coast region, and turned up in New York, September 27, without any report of Montana—without any Government funds to pay for one, and the Report must be in by the meeting of Congress in December, or the Territory be unrepresented. Professor Eaton; then in New York, volunteered to have a preliminary Report of Montana prepared in time, and with the gratuitous assistance of Professor Keyes and Colonel De Lacy, Montana again had the most valuable papers in the Report. And now comes the final Report. Again Mr. Raymond has visited Colorado and the Pacific coast, and is at present in Idaho. But there is no intimation of his visiting Montana, and Montanians must again, gratuitously, we presume, furnish the Report, or the Territory will be ignored. The Commissioners get paid for their work. Other Territories and States are visited. Why is this, the second gold-producing Commonwealth, persistently passed by unvisited! The ability and integrity of the gentlemen who have made the Montana Reports are unquestioned; but this region is accessible, important, and should receive, in common with others, the personal attention of the Commissioner. As it does not, there is the greater reason why all in possession of valuable facts and statistics should assist those who have undertaken the task."

A few considerations which occur to us, as tending to mitigate the severity of this criticism, we venture to submit:

1. It is *not true* that the Government pays from $10,000 to $40,000 per annum for these Reports. The total appropriations for *four* years amount to $37,500; for the last *two* years, to $12,500. *No appropriation has ever been made* for this purpose in the region east of the Rocky Mountains. The fault is not Mr. BROWNE'S, nor Mr. RAYMOND'S, nor Mr. TAYLOR'S; it lies with the people of Montana, who have plenty of energy to spare in finding fault with those who try to help them, but none to expend in helping themselves. Messrs. KEYES, LANGFORD, EATON, DE LACY, and others, who have generously attempted at different times to supply this deficiency, have met with little or no encouragement from the citizens.

2. It is *not true* that the Commissioner is paid sufficient to enable him to visit each State and Territory every year. It is *not true* that he is expected to do so. The absurdity of the notion is evident from the fact that an *Annual Report* is demanded—a duty incompatible with the constant travelling which this critic supposes to be the only function of the Commissioner. This Report is the object of the Congressional appropriation; and it is wisely left to the discretion of the Commissioner to go where he thinks his personal presence is most needed. The critic admits that Montana has had the best papers in the successive reports, but hints repeatedly that no credit is due the Commissioners for this. Why not? If Montana has come off so much better than the regions actually visited by the Commissioners, were they not wise and generous in staying away and employing better men?

3. It is *not true* that Messrs. Eaton and Keyes did their work "gratuitously." They did, indeed, receive sums ridiculously inadequate to the value of their services; but all that could be afforded them out of the whole available sum ($5,000) with which it was necessary to defray the Commissioner's salary, travelling expenses for 13,000 miles, and all assistance. Besides this, their very generous aid was contributed from motives of personal and professional friendship for the Commissioner, with which the public has nothing to do. It is probable, however, that they were also moved by a public-spirited desire to serve the Territory—a spirit which is growing "almighty scarce" in the Territory itself. Montana started with less of it than almost any other mining region, and has been steadily losing it ever since. Let the *New Northwest* consider whether some of its excellent English might not be profitably bestowed, first, on a decent and honorable apology, and, secondly, on an attempt to sting the citizens of Montana into vitality enough to inspire them to reply at least to the letters of those who ask information of them concerning their own resources and progress.

4. The reasons why the present Commissioner did not visit Montana this year, are few and simple. In the first place, he sets up an *alibi*. He went somewhere else, where it was absolutely necessary for him to go, in order to seek out proper *resident agents* (the only kind worth anything) for the collection of information. In the second place, he knew of persons in Montana whose work in such a case would be much more thorough and full than his could possibly be made *en route*. In the third place, however, for his own sake, and not at all because Montana was in danger of being neglected, he had resolved to visit that Territory, although his correspondents warned him that it was a most unfavorable season for such a purpose. Probably, if he had carried out his intention, he would have received an unfair impression of its condition and prospects. Fortunately for the Territory, though unfortunately for the Commissioner, he was, by certain accidents and fatigues of some 8,000 miles' continuous travel, physically disabled, and thus prevented from undertaking the trip, which he hopes to carry out on some future occasion—by which time the *New Northwest* will be older and more charitable.

Intelligence Wanted.

A GEORGIA correspondent writes as follows:

"I desire to get an instrument which will detect the location of gold deposits, and also places where gold has been buried. I have a mine on my place, and would like to get the most improved instrument which will answer my purposes for that, and also to find the spot where a friend of mine buried some gold, of which he has lost the location, by the spot having been defaced by the army during the late war. Please send price of it. I would like a very strong instrument, which will be sure to make correct indications. If price is not too high, will forward money and get you to purchase me one. P. S.—Probably Messrs. —— & Co. could give the desired information, as they are cognizant of the like, being connected with the Patent Office."

The instruments desired by our friend are no longer to be had. They have gone out of market—went out, in fact, when spelling-books came in. Even Messrs. —— & Co., though they have patented everything else under the sun, have never fathered one. As the next best thing in the premises, we have consulted, through a medium, the spirit of DOMINUS DOCTISSIMUS AUREOLUS PHILIPPUS PARACELSUS THEOPHRASTUS BOMBASTES VON HOHENHEIM, but we regret to say that the old gentleman, having been dead three hundred years, has degenerated into a very ordinary person. He replies, just as any one, not dead at all, might have done: "I you have a gold mine on your property, there is probably gold in the mine"—[you are too positive there, venerable sage!]—"and if your friend buried a treasure, and the army 'defaced the spot,' then your friend may expect to recognize the spot by the defacement, but not to find any gold in it." We refused to pay the medium for this trivial reply, and we charge our correspondent nothing for our trouble.

Bringing the Sea Ashore.

IN the recent dire scarcity of Croton, the work of sprinkling the streets of New York was performed with salt water; and, doubtless, had any serious conflagration occurred during the same period, we should have been forced to have recourse to the same quarter. Now that the exigency has passed, it is none the less advisable to consider the feasibility of permanently reducing the unnecessary consumption of fresh water, in the manner indicated. The engineer of the Board of Health has recently made an able report on the subject, recommending the division of the city below Fifth-ninth street into two districts, one above and the other below Fourteenth street. For these districts he proposes the erection of pumping engines at the Fortieth street reservoir and at the corner of Canal and Walker streets, to which the water would be brought through brick conduits. The estimated quantity required for the streets is 5,200 gallons per minute, and the maximum for the fire department, on occasion, 4,200 gallons per minute. To satisfy these requirements, the engines should have a daily working capacity of 6,000 gallons per minute, and the strength, in case of need, to distribute 9,000 gallons per minute. Of course, on extraordinary occasions, (such as can scarcely occur with a well-regulated fire department), this whole supply of 9,000 gallons might be devoted to the work of extinguishing fires, leaving the streets, for a few hours, unwatered. The pumps would deliver the water into a stand-pipe under a head of 100 to 150 feet above tide-level. It is further proposed to utilize the constant reserve of power thus obtained by using the up-town engine to force fresh water to the houses on Murray Hill, and by supplying water-power to wholesale establishments where heavy hoisting is done, and where, at present, fresh water is consumed for the purpose of making steam. With such a pressure of water through the mains, our wasteful though efficient steam fire engines might be measurably done away, and a more economical and immediately applicable system introduced. The estimated cost of construction, including duplicate engines at both stations, is about $4,000,000, and the cost of annual maintenance, $130,000. If the present expense of street watering, street cleaning, sewers and fire engines is considered, and the saving to be effected by the new plan in all these particulars is compared with its cost, it certainly appears to be one of the most economical improvements which could be suggested.

The engineer's report, as published, contains no discussion of the chemical aspects of the case, beyond the statement that the action of rust does not appear to be any greater with salt water than with fresh—an opinion founded on the experience of sugar refiners, who now use the salt water, but partially contradicted by the action of the sea on the hulls of monitors. He might have added to the other advantages of his plan the fact that salt water will extinguish fire more rapidly than fresh, and the fact that the well-known anti-septic properties of the chloride of sodium would remove to some extent the objections urged by physicians against the watering of the streets in hot weather. It will be remembered that this point was considered by the Board of Health during the cholera season.

Artists might also advocate the throwing of salt water upon fires, because it imparts to the flame a fine lurid color; but this argument may be held in reserve to turn the scale if the event should seem dubious. On the other hand, there is a serious objection to the use of salt water in the streets, which does not appear to have suggested itself to the Engineer or the Board. We can add but a brief statement of it, and we do not undertake to determine at present the extent to which it should influence the decision of experts. The application of salt to thaw the ice and snow from horse-railways in the city was condemned, because it was found to affect injuriously the feet of horses, and also to attack the soles of boots and shoes. These evils were great, and concerned the whole population, with the exception of that small number who go barefoot in winter, and may, for all we know, like to have their toes pickled. They led, therefore, to the peremptory prohibition of the use of salt in the manner referred to. Now, is there no reason to fear similar results from the constant use of brine in the streets? It is true that the sea is but a weak solution at the best, and the water of the North river dilutes it still further at this point; but would not repeated sprinkling and evaporation finally leave in the mud of the streets a concentrated deposit? Possibly occasional rains would wash it clean away, or the *very free* use of the brine might keep it so diluted as to render it innoxious; but the matter should not be left to such hypothetical relief. It would be a costly experiment to build engines, mains, and hydrants, and then find the hoped-for advantages neutralized by a tremendous destruction of hoof and shoe-leather. "The leathery Herr Papa" down in the "Swamp" might like such a state of things; but we remaining population, who are pinched both when we wear and when we pay for our boots, would loudly complain. The papers report, however, that the engineer's report was immediately referred to the Sanitary Committee "with orders to commence the work as soon as the treasury of the Board contains the estimated sum." We are not alarmed, however; there is no immediate prospect of four millions of dollars in the treasury alluded to. Otherwise, we might inquire by what right the Board of Health can proceed to reconstruct, on the report of one man, and without due examination or special authority, the water system of the metropolis.

The Indianapolis Disaster—An Important Statement.

LAST evening a reporter of the *Journal* visited the house of Mr. John Reynolds, on North Delaware street, and had an interview with Mr. John White, of Windfall, Tipton county, who is there quite seriously wounded. The following is the substance of the statement made by him :—

"I am a practical engineer, having been engaged in running mills for the past four years, and am running one now. I came up to the city for the purpose of purchasing a set of head blocks, and went to the mill at the Fair grounds for the purpose of seeing them work ; indeed I thought I might buy the ones being used there. I went around by the boiler which was making the steam to drive the mill, and saw that they were carrying too much steam, the indicator showing from 110 to 130 pounds. I did not feel right then. The engine was being run by a large man, and fired by a small one. The engineer tried the water, touching the lower gauge, which emitted blue steam, but no water. The gauge opened above a little cup, and I saw him feel in it with his little finger, but it had received no water from the gauge. He tried it again, and then raised up on his tiptoes, and, seeing that it was empty, I saw him cringe in the face, showing indications of great fright. He then went to the pump and turned on the water, and as I saw him do that I started away as fast as I could walk, and had gotten opposite the end of the carriage, when I turned my head to look back, and at that instant the boiler exploded, bruising my head, face, and side, and scalding me very badly. When I saw the engineer start to turn on the water, my first impulse was to tell him not to do it ; but I thought again that I might alarm the crowd needlessly, and I left as fast as I could walk, without saying anything. The engine was rotating very slowly, or I could not have gotten away before the explosion occurred. If the engineer had not turned on the water, I do not think the explosion would have occurred. I knew that the steam was superheated by its color."

Mr. White is a perfectly reliable gentleman, a member of the Society of Friends, and his statement can be relied upon as correct in every particular. Our reporter informed the Coroner's Jury of the statement made by Mr. White, but they did not deem it necessary to take his evidence.

This is undoubtedly the true explanation of the cause of the explosion. The engine had not entirely stopped ; it was moving slowly, and it will be remembered that Mr. Frink testified to hearing the gauge-cock tried twice just before the explosion, and it is probable that it was done by the engineer, who then became frightened, and by his action caused what he was trying to avert, an explosion.—*Indianapolis Journal of October 6.*

Rapid Settlement of the West.

THE records of the General Land Office show that in twenty-four land offices in Minnesota, Wisconsin, Kansas, Nebraska, Dacotah, Idaho, Montana, and Utah, during the month of June, there were 800 cash entries of land, covering an area of 108,804 acres, and 1,375 homestead entries, covering 176,597 acres—making a total of 2,175 entries, and 282,481 acres. During the quarter ending June 30, there were 2,191 cash entries, covering 216,900 acres, and 2,039 homesteads, covering 454,846 acres—making a total of 6,130 entries, and 771,746 acres. The cash receipts for the quarter were over half a million dollars.

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" Do. properties of
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" The nature and quality of
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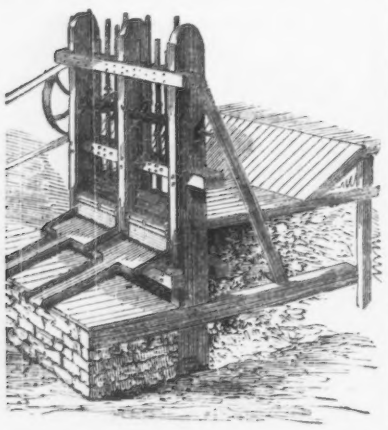

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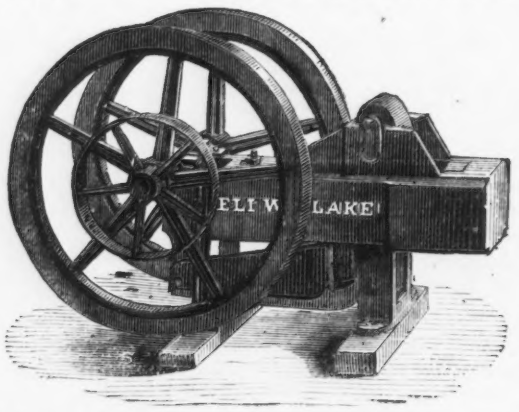

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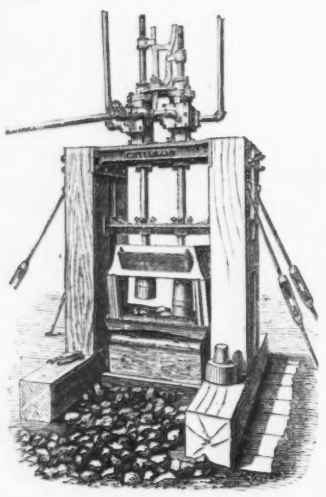

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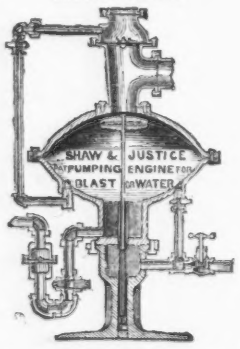

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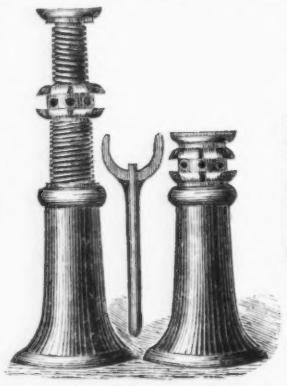

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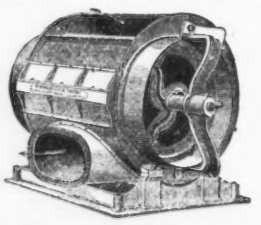

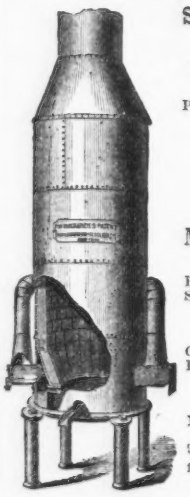

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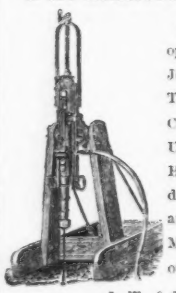

Is now in succesful working operation in New York, Chicago, Jersey City: also at the Hoosac Tunnel (Mass.), Lake Superior, Colorado, and Nova Scotia Mines, Union Pacific and Boston and Hartford Railroads; also in deepening the beds of the Illinois and Michigan Canals, and Des Moines Rapids, and numerous other localities.

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43 New Street, New York,
General Agents for the United States and Europe.
Aug 31-2mo

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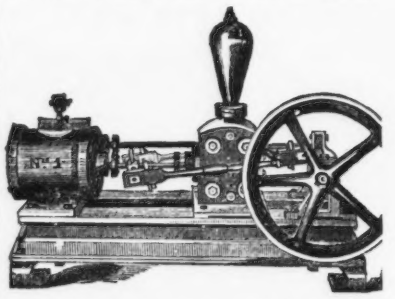
THE WOODWARD
Steam Pump Manufacturing Company,

MANUFACTURERS OF THE
WOODWARD PATENT IMPROVED SAFETY
Steam Pump and Fire Engine.



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Also dealers in WROUGHT IRON PIPE, BOILER TUBES, etc. Hotels, Churches, Factories, and Public Buildings, heated by Steam, Low Pressure.

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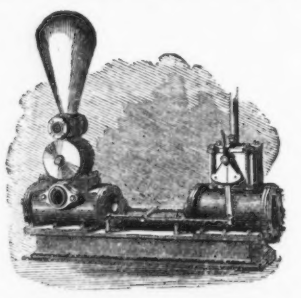

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Sole Manufacturer of
HARDICK'S PATENT DOUBLE-ACTING
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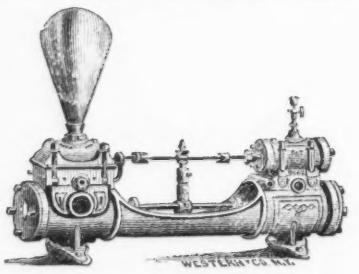

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Air Pumps, Blowing Engines, Hydraulic Pressure Pumps, New Locomotive Pumps, Fire Pumps, Boiler, Feed, Marine, Drainage, Sugar-work, Brewery, Distillery, Oil and Wrecking Pumps.

Improved Horizontal and Vertical
MINING PUMPS
(Working with Plungers, and especially arranged for pumping water containing dirty or gritty matter.)

Pumps for every possible duty, and all fully guaranteed. Also,

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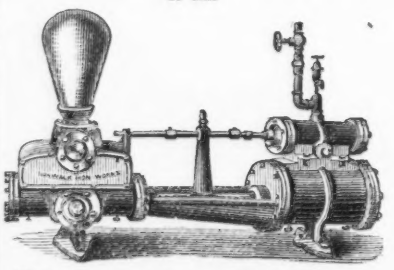

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STEAM AND BLOWING ENGINES,

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IRON AND BRASS CASTINGS, of every description.

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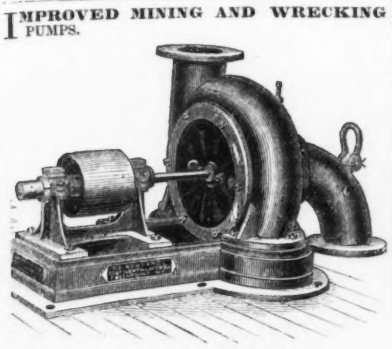

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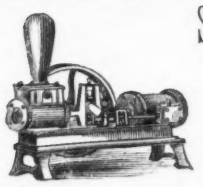
Patent Fly Wheel and Direct Action



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Steam Pumping Engines, Single and Duplex, Worthington's Patent, for all purposes, such as Water Works Engines, Condensing or Non-condensing; Air and Circulating Pumps, for Marine Engines; Blowing Engines; Vacuum Pumps, Stationary and Portable Steam Fire Engines; Boiler Feed Pumps, Wrecking Pumps,

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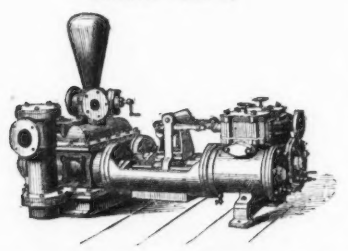

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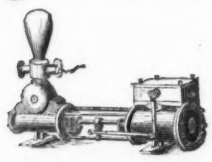

Steam Pumps,
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COMPRESSES AIR OR GAS TO ANY REQUIRED PRESSURE.

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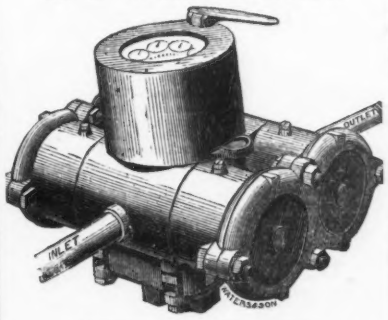

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This Meter is also Used for the Measurement of Oil.

IT COMBINES

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with such ease and certainty of motion as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our larger cities.

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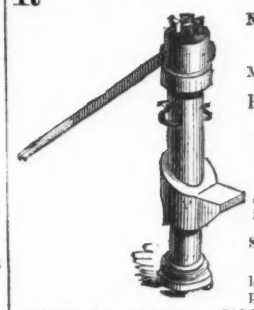
RICHARD DUDGEON,



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Maker and Patentee of

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Communications by letter will receive prompt attention.

JACKS for pressing on CARWHEELS or CRANK PINS made to order. May22:1y

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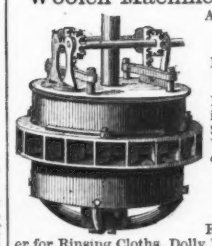

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Engines, Boilers, Pumps, Hoisters,

OSCILLATING ENGINES, run at great speed. Sizes 1-2 to 250 Horse-Power.

SMOKE-BURNING AND SUPER-HEATING BOILERS are economical and Safe.

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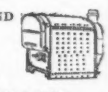

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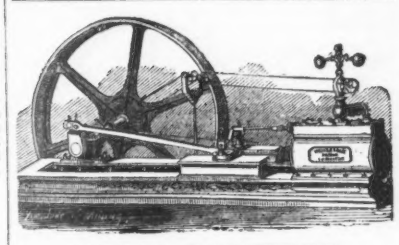

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Lathes, Planers, Drills, Chucks, etc. Iron and Brass Castings. Judson & Snow's Patent Governors constantly on hand.

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T. S. POST & Co., Benham, Texas, say: "Since using Winans' Powder, we save ONE cord of wood per day (one-half our fuel), and have better steam, and would not be without the article for ten times its cost."

The Cleveland (Ohio) Paper Mills removed scale 22 inches long by 9 wide and 1¼ inch thick.

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PATENT FIRE CORRUGATED

IRON SHUTTERS AND DOORS,

MANUFACTURED EXCLUSIVELY BY THE

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We particularly invite the attention of owners of buildings and Insurance companies to an examination of these Shutters and doors, which are unequalled as protectors against fire.

Practical tests have demonstrated their superior ability to resist heat, over the flat iron shutters and doors of the best and costliest kind.

As is well known, flat iron shutters will warp from heat of fire, and often of the sun.

Our Shutters *will not warp* under any circumstances. They are stiff, strong, light, and ornamental, being made to fit with exactness any opening, and particularly easy to handle, they can be used in many places where heavy shutters are impracticable.

Among our specialities in doors are

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We deliver and hang all our doors and shutters at any point.

Their cost is less than that of any other fire iron door or shutter.

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Our Iron Covering is acknowledged as being the best for any building, having all the dryness of wood and the durability and warmth of brick.

It meets the requirements of any city fire law, and its cost is much less than that of brick.

Plans and specifications, with estimates, furnished upon application.

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BRANCH OFFICE, NOS. 77 AND 83 LIBERTY STREET,

Manufacture

ACHITECTURAL IRON-WORK

OF ALL KINDS.

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THE STEAM GENERATOR

Manufacturing Company of Penn.

This Company is now prepared to furnish

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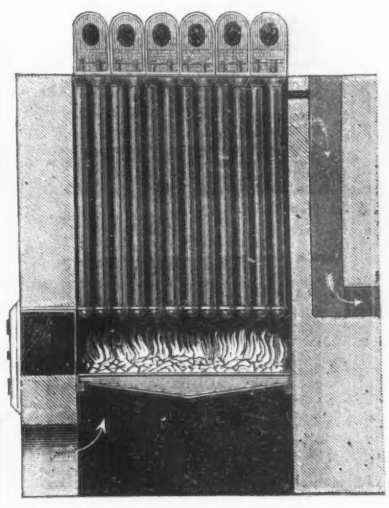

Patent Improved Steam Generator,

Of any power required, upon two weeks' notice. They have been introduced in this city and thoroughly tested, with most satisfactory results, and are sold under Guarantee of Absolute

Safety from Destructive Explosion.

They are cheaper in first cost and in expense of erection, more economical in fuel, durable and convenient in use, than any other apparatus for generating steam. For Mining purposes it is unequalled, owing to the facility with which it can be transported and erected.

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Over 100 sold—tested to 300 lbs., no large sheet-iron shell to explode. Economical and durable. All sizes on hand. Also, Steam Engines, Steam Pumps, etc. Send for pamphlets and price lists.

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OIL AND WATER TANKS,
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CIRCULAR SAWS WITH EMERSON'S PATENT MOVEABLE TEETH.

These Saws are meeting with unprecedented success, and their great superiority over every other kind, both as to efficiency and economy, is now fully established.

Also,

EMERSON'S PATENT PERFORATED CIRCULAR AND LONG SAWS,

(All Gumming avoided,) and

EMERSON'S PATENT ADJUSTABLE SWAGE,

for Spreading, Sharpening, and Shaping the teeth of all Saws. Price, $5. Manufactured by the

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Saw Mills, Saw Arbors, Scroll Saws; Railway, Cut-Off, and Rip-Saw Machines; Spoke and Wood Turning Lathes, and various other kinds of Wood-working Machinery.

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Warehouse, 107 Liberty Street, New York.
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Matching Machines, Moulding Machines, Saw Benches, Chair Lathes, Self-Oiling Pulleys, etc.

june5-tf FITCHBURG, MASS.

RAILROADS.

LEHIGH & SUSQUEHANNA RAILROAD.
(LEHIGH COAL AND NAVIGATION CO.)

Summer Arrangement.

On and after Monday, July 12, 1869, Passenger Trains on the Lehigh & Susquehanna Railroad will run as follows:

DOWN TRAINS.

	No. 1. A.M.	No. 3. A.M.	No. 5 P.M.	No 7. P.M.
Leave Green Ridge	9:05	7:00	1:00	5:15
Scranton	9:10	7:05	1:05	5:20
Pittston	9:36	7:35	1:35	5:52
Wilkesbarre	10:00	8:00	2:00	6:17
White Haven	11:23	A.M.	P.M.	P.M.
				No. 9.
Mauch Chunk	12:00			A.M.
	1:03			6:50
Catasauqua	2:01			8:04
Allentown	2:10			8:15
Bethlehem	2:20			8:30
Easton	2:48			9:05
Phillipsburg	2:52			9:10
Philadelphia	4:45			A.M.
Arrive New York	6:30 C.R.R.			
	9:40 M. & E.R.R.			
	P.M.			

UP OR NORTHWARD TRAINS:

	No. 2. P.M.			No. 10 A.M.
Leave New York	9:00 C. R. R.			
	8:30 M. & E. R.R.			
Philadelphia	9:45			
Phillipsburg	11:50			7:00
Easton	11:55			7:04
Bethlehem	12:23			7:36
Allentown	12:36			7:50
Catasauqua	12:53			8:04
Mauch Chunk	2:05			9:20
		No. 4.	No. 6.	No. 8.
White Haven	3:23	A.M.	P.M.	P.M.
Wilkesbarre	5:00	8:30	2:25	6:45
Pittston	5:25	8:55	2:50	7:10
Scranton	5:56	9:26	3:20	7:40
Arrive Green Ridge	6:00	9:30	3:25	7:45
	P.M.	A.M.	P.M.	P.M.

Connections.

DOWN TRAIN No. 1, makes close connection at Penn Haven with Lehigh Valley Railroad, for Beaver Meadow, Hazleton and Mahanoy City.

DEL. & HUDSON CANAL CO., R.R.—Up trains Nos. 4 & 6, and down trains Nos. 1 and 7 connect at Green Ridge with trains on Delaware & Hudson Railroad, to and from Carbondale.

NORTH PENNA. R.R.—Down train No. 1, and up train No. 0 connects at Bethlehem with trains on North Pennsylvania R.R., arriving at Philadelphia at 4:45 P.M. Returning, leave Philadelphia for Scranton, Wilkesbarre and Mauch Chunk at 9:45 A.M.

LEHIGH & LACKAWANNA R.R.—Down train Nos. 1 and 0, and up train Nos. 2 and 0 connect at Bethlehem with Lehigh & Lackawanna R. R. for Bath and Chapman Quarries. Returning leaves Bath at 7:00 A.M.

MORRIS & ESSEX R. R.—Down train No. 1 and 0 connect at Easton with Morris & Essex Railroad for Newark and New York. Returning leave New York (Barclay street,) for Scranton, Wilkesbarre and Mauch Chunk at 8:00.

CENTRAL RAILROAD OF NEW JERSEY.—Down trains Nos. 1 and 9 connect at Phillipsburg with trains for New York. Returning, leave New York (foot of Liberty street,) for Scranton, Wilkesbarre and Mauch Chunk at 9:00 A. M.

BELVIDERE & DELAWARE R.R.—Down train No. 0 and up train No. 2 connect at Phillipsburg with Belvidere & Delaware Railroad to and from Trenton and Philadelphia.

MENDES COHEN,
Superintendent.

LEHIGH VALLEY RAILROAD.

ON AND after June 1, 1869, trains on the Lehigh Valley Railroad will run as follows:

DOWN TRAINS.

	A.M	P.M.
Leave Tunkhannock	6 20	
L. & B. Junction	7 30	1.15
Pittston	7.40	1.25
Wilkesbarre	8.00	1.45
White Haven	9 25	3.08
Mauch Chunk	10.35	4.20
Allentown	11.43	5.50
Bethlehem	11.55	6.05
	P.M.	
Easton	12.25	6.35
Philadelphia	2.10	8.35
Arrive New York	3.50	9.00

UP TRAINS.

	P. M.	M.
Leave New York	6.50	12.00
		P. M.
Philadelphia	7.45	1.45
Easton	10.00	3.25
Bethlehem	10.30	4.00
Allentown	10.45	4.20
	M.	
Mauch Chunk	12.00	5.45
	P. M.	
White Haven	1.32	7.18
Wilkesbarre	2.50	8.35
Pittston	3.10	8.55
L. & B. Junction	3.20	9.05
Arrive Tunkhannock	4.30	

☞ No change of cars between Scranton and New York, or between Scranton and Philadelphia.

ROBERT H. SAYRE, Sup't and Eng.
H. STANLEY GOODWIN, Ass't Gen. Supt.
June 1, 1869.

DELAWARE, LACKAWANNA & WESTERN R. R.—Morris & Essex Division.

Summer Arrangement,

Commencing Monday, April 5, 1869, and running on the following time until further notice.

	L. and Express. A. M.	Scranton. Mail. A.M.	Scranton. Express. P. M.
Leave Easton	6.55	11 30	5.30
Washington	7.28	12.10	6.15
Hackettstown	7.48	12.36	6.45
Dover	8.30	1.24	7.30
Rockaway		1.34	
Morristown	9.00	2.00	8.00
Orange		2 50	8.50
Newark	9.50	3.00	9.00
Arrive New York	10.25	3 35	9.40
	A.M.	P. M.	P.M.

RETURNING.

	P. M.	A. M.	A.M.
Leave New York	4.00	7.00	8.30
Newark	4.40	9.05	7.40
Orange			7.53
Morristown	5.33	10.00	8.45
Rockaway			9.09
Dover	6.00		9.20
Hackettstown	6.42	11.05	10.08
Washington	7.02	11.25	10.33
Arrive Easton	7.35	11.57	11.10

Connections.

At Washington, with Delaware, Lackawanna & Western Railroad, for Water Gap, Stroudsburg, Wilkesbarre, Carbondale, Scranton and Great Bend.

At Easton, with Lehigh Valley and Lehigh & Susquehanna Railroads for Bethlehem, Allentown, and Mauch Chunk.

S. SCHOCH,
Ass't Superintendent.

R. A. HENRY,
Gen. Passenger Agent.
Hoboken, N. J., April 21, 1869.

RAILROADS.

READING RAILROAD.

GREAT TRUNK LINE from Philadelphia to the interior of Pennsylvania, the Schuylkill, Susquehanna, Cumberland and Wyoming Valleys, the North, Northwest, and the Canadas.

Summer Arrangement of Passenger Trains, July 12, 1869.

Leaving the Company's Depot, Thirteenth and Callowhill streets, Philadelphia, at the following hours:

MORNING ACCOMMODATION.

At 7.30 A M. for Reading and all intermediate stations and Allentown. Returning, leave Reading at 6.30 P. M., arrive in Philadelphia 9.15 P.M.

MORNING EXPRESS.

At 8.15 A. M., for Reading, Lebanon, Harrisburg, Pottsville, Pinegrove, Tamaqua, Sunbury, Williamsport, Elmira, Rochester, Niagara Falls, Buffalo, Wilkesbarre, Pittston, York, Carlisle, Chambersburg, Hagerstown, &c.

The 7.30 A. M. train connects at READING with East Pennsylvania Railroad trains for Allentown, &c., and the 8.15 A.M. train connects with the Lebanon Valley train for Harrisburg, &c.; at PORT CLINTON with the Catawissa Railroad trains for Williamsport, Lock Haven, Elmira, &c.; at HARRISBURG with Northern Central, Cumberland Valley, and Schuylkill and Susquehanna trains for Northumberland, Williamsport, York, Chambersburg, Pinegrove, &c.

AFTERNOON EXPRESS

Leaves Philadelphia at 3.30 P.M. for Reading, Pottsville, Harrisburg, &c., connecting with Reading and Columbia Railroad trains for Columbia. &c.

POTTSTOWN ACCOMMODATION

Leaves Pottstown at 6.25 A M., stopping at intermediate stations; arrives in Philadelphia at 8 40 A. M. Returning, leaves Philadelphia at 4.30 P. M., arriving in Pottstown at 6.40 P.M.

READING ACCOMMODATION

Leaves Reading at 7.30 A.M., stopping at all way stations; arrives in Philadelphia at 10.15 A.M.

Returning, leaves Philadelphia at 5.15 P. M.; arrives in Reading at 8.00 P.M., and connects with Market Train for Pottsville.

Trains for Philadelphia leave Harrisburg at 8.10 A.M. and Pottsville at 8.45 A.M., arriving in Philadelphia at 1.00 P.M. Afternoon trains leave Harrisburg at 2 05 P. M. and Pottsville at 2.45 P.M., arriving at Philadelphia at 6.45 P. M.

HARRISBURG ACCOMMODATION

Leaves Reading at 7.15 A.M. and Harrisburg at 4.10 P.M. Connecting at Reading with Afternoon Accommodation south at 6.30 P.M., arriving in Phildelphia at 9.15 P. M.

MARKET TRAIN, with a passenger car attached, leaves Philadelphia at 12.45 P. M. for Pottsville and all way stations; leaves Pottsville at 5.40 A.M., connecting at Reading with Accommodation Train for Philadelphia and all way stations.

All the above trains run daily, Sundays excepted.

Sunday trains leave Pottsville at 8.00 A.M. and Philadelphia at 3.15 P. M.

Leave Philadelphia for Reading at 8.00 A.M. Returning from Reading at 4.25 P.M.

CHESTER VALLEY RAILROAD.

Passengers for Downingtown and intermediate points take the 7.30 A.M., 12.45 and 4 30 P.M. trains from Philadelphia, returning from Downingtown at 6.10 A.M., 1.00 and 5.45 P.M.

PERKIOMEN RAILROAD.

Passengers for Skippack take 7.30 A M., 4 30 and 5.15 P.M. trains from Philadelphia; returning from Skippack at 6.15, 8.15, A. M. and 1.00 P. M. Stage lines for various points in Perkiomen Valley connect with trains at Collegeville and Skippack.

NEW YORK EXPRESS, FOR PITTSBURG AND THE WEST.

Leaves New York at 9.00 A. M. and 5.00 and 8.00 P.M., passing Reading at 1.05 A.M. and 1.50 and 10.19 P.M., and connecting at Harrisburg with Pennsylvania and Northern Central Railroad Express Trains for Pittsburg, Chicago, Williamsport, Elmira, Baltimore, &c

Returning, Express Train leaves Harrisburg on arrival of Pennsylvania Express from Pittsburg at 2.35 and 5.20 A. M., 10.55 P. M. passing Reading at 4.30 and 7.05 A. M. and 12.50 P. M.; and arriving at New York at 11.00 A. M. and 12.20 and 5.00 P. M. Sleeping cars accompany these trains through between Jersey City and Pittsburg without change.

A mail train for New York leaves Harrisburg at 8.10 A.M. and 2.05 P. M. Mail train for Harrisburg leaves New York at 12 noon.

SCHUYLKILL VALLEY RAILROAD.

Trains leave Pottsville at 6.30 and 11.30 A. M. and 6 40 P.M., returning from Tamaqua at 8.35 A. M. and 2.15 and 4.15 P.M.

SCHUYLKILL AND SUSQUEHANNA RAILROAD.

Trains leave Auburn at 6.25 A. M. for Pinegrove and Harrisburg, and at 12.10 P.M. for Pinegrove and Tremont; returning from Harrisburg at 6.20 P. M., and from Tremont at 6,45 A.M. and 7.40 P.M.

CENTRAL RAILROAD OF NEW JERSEY.

—Passenger and Freight Depot in New York, foot of Liberty street; connects at Hampton Junction with the Delaware, Lackawanna and Western Railroad, and at Easton with the Lehigh Valley Railroad and its connections, forming a direct line to Pittsburgh and the West without change of cars.

ALLENTOWN LINE TO THE WEST.

Three Express Trains to the West, except Sundays, when one train in the evening.

Sixty miles and three hours saved by this line to Chicago, Cincinnati, St. Louis, &c, with but one change of cars.

Silver Palace cars through from New York to Chicago.

SUMMER ARRANGEMENT.

Commencing August 16, 1869.—Leave New York as follows:

6.55 A. M.—For Easton, Bethlehem, Mauch Chunk, Williamsport, Wilkesbarre, Mahanoy City, Tukhannock,

7.15 A. M.—For Somerville.

8.30 A. M.—For Flemington, Junction, Stroudsburg, Water Gap, Scranton, Kingston, Pittston, Great Bend,

9 A. M.—WESTERN EXPRESS.—For Easton, Allentown, Harrisburg and the West, without change of cars to Cincinnati or Chicago, and but one change to St. Louis. Connects at Harrisburg for Erie and the Oil Regions. Connects at Junction for Stroudsburg, Water Gap, Scranton, &c. Connects at Phillipsburg for Mauch Chunk, Wilkesbarre, &c.

12 M.—For Flemington, Easton, Allentown, Mauch Chunk, Wilkesbarre, Reading, Columbia, Lancaster, Ephrata, Litiz, Pottsville, Scranton, Harrisburg, &c.

3.30 P. M.—For Easton, Allentown, Mauch Chunk and Belvidere.

4.30 P. M.—For Somerville.

5.00 P. M.—CINCINNATI EXPRESS.—For Easton, Bethlehem, Allentown, Reading, Harrisburg, Pittsburgh, Chicago and Cincinnati. Sleeping Cars to Pittsburgh and Chicago. Connects at Junction with Delaware, Lackawanna and Western Railroad for all Stations to Scranton.

5.25 P. M.—For Somerville and Flemington.

6 P. M.—For Easton and intermediate stations.

7.00 P. M.—For Somerville.

8.00 P. M.—WESTERN EXPRESS TRAIN.—For Easton, Allentown, Reading, Harrisburg, Pittsburgh and the West—connects at Harrisburg with train for Williamsport, Erie, &c.

8.10 P. M.—EMIGRANT—Stopping only at principal stations.

9.00 P. M.—For Plainfield.

11.45 P. M.—For Plainfield on Wednesdays and Saturdays only.

Sleeping cars through from Jersey City to Pittsburgh every evening.

Trains leave for Elizabeth at 5.45, 6.30, 6.55, 7,15, 8.15, 8.30, 9.00, 9.20, 0.30, 11.40 A. M., 12.00 M., 1.00, 2.00, 3.00, 3.30, 3.45, 4.15, 4.30, 4.45, 5.10, 5.25, 5.45, 6.00, 6.25, 7.00, 7.45, 8.00, 8.10, 9.00, 9.45, 10 45, 11.50 P. M.

Tickets for the West can be obtained at the office of the Central Railroad of New Jersey, foot of Liberty street, N. Y.; at No. 1 Astor House; Nos. 254, 271, 526 Broadway; at No. 10 Greenwich street, and at the principal hotels. R. E. RICKER, Superintendent.

H. P. BALDWIN, Gen. Pass. Agent.

RAILROADS.

MORRIS AND ESSEX RAILROAD.

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Summer arrangements, commencing MONDAY, May 10, 1869.

8.00 A. M.—MAIL TRAIN.—Connecting at Denville with Boonton Branch, at Dover with Chester Branch, at Waterloo with the Sussex Railroad for Andover and Newton, at Washington with the D. L. and W. Railroad for Water Gap, Stroudsburg, Scranton, and Great Bend, and all points on the Lackawanna and Bloomsburg, and Delaware and Hudson River Railroad; at Easton with the Lehigh and Susquehanna Railroad for Bethlehem, Allentown, Mauch Chunk, and Wilkesbarre.

11.30 A. M.—LEHIGH VALLEY EXPRESS—Stops at Newark, Morristown, Dover, Hackettstown, Washington, Phillipsburg, and Easton; connects at Phillipsburg with Bel., Del. Railroad for Belvidere, &c., and at Easton with L. V. R. R. for Bethelehem, Allentown, Mauch Chunk, and Wilkesbarre.

4.00 P. M.—SCRANTON EXPRESS—Connects at Washington with the D. L. & W. R. R. for Water Gap, Stroudsburg, and Scranton at Dover with Chester Railroad, and at Waterloo with Sussex Railroad.

6.30 A. M. and 4.30 P. M.—To Summit and intermediate stations.

6.30, 7.30, 9,30 A. M., and 1.00, 3.40, 5.30, 8.45, 11.45 P. M.—To South Orange and intermediate stations.

11.40 A. M., 3.00 and 6.30 P. M.—To Morristown and intermediate stations.

5.10 P. M.—Morristown Express.

For Newark at 6 30, 7.30, 8.00, 8.30, 9.30, 10.30, 11.00, 11.30, 11.40, A. M., 1.00, 2.00, 3.00, 3.30, 3.40, 3.50, 4.00, 4.30, 5.00, 5.10, 6.10, 6.30, 7.45, 8.45, and 11.45 P. M.

For Bloomfield and Montclair—At 8 30, 11.00 A. M.; 2.00, 3.50, 5,00 and 6.10 P. M.

S. SCHOCH, Assistant Superintendent,
R. A. HENRY, G. P. Agent.

NEW JERSEY RAILROAD—For PHILADELPHIA.

Via Kensington, *6.30 p. m.; on Sundays, via West Philadelphia.

Via Camden, 1 p. m. and 4 p. m.

Via West Philadelphia, 7 a. m., 8.40 a. m., 10 a. m., 12.30 p. m., 5 p. m., *9 p. m., 9.20 p. m., and 12 night.

For Baltimore and Washington—8.40 a. m., 12.30 p. m., *9.26 p. m.

For South and Southwest—8.40 a. m., and *9.20 p. m.

FOR THE WEST.

8.40 a. m., 12.30 p. m., 5 p. m., *9 p. m., and *9.20 p. m.

The 8.40 a. m., and *9 p. m. trains through, with but one change, to Cincinnati and Chicago.

Silver Palace Sleeping Cars attached to the 5 p. m. train run through to Cincinnati and Chicago without change, daily, (Saturdays and Sundays excepted); and on those days to the 9 p. m. train. This is the only line running through cars to Chicago by evening lines.

TICKET OFFICE FOOT OF CORTLANDT ST.

Tickets for sale in Reclining Chair cars can be obtained at foot of Courtland street and 944 Broadway.

May 10th, 1869. F. W. JACKSON,
*Daily. General Superintendent.

MISCELLANEOUS.

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Edwin J. Hulbert, Secretary,

To whom all communications may be addressed.

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EDWIN J. HULBERT, Secretary.

The operation of our machinery may be examined by application to WM. SELLEW, Esq., Superintendent, at the Works on the Etna-bog, 3 miles north of Meriden, Conn., on line of Hartford and New Haven Railroad.

July 6-tf

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☞ For sale also in New York, at the Office of THE ENGINEERING AND MINING JOURNAL, wholesale and retail. mh13-tf

PEOPLE'S LINE FOR ALBANY.

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PUBLICATIONS.

THE MINES OF COLORADO:

BY CVANDO J. HOLLISTER.

LATE EDITOR AND PROPRIETOR OF "THE COLORADO MINING JOURNAL."

The approaching completion of two lines of railway between the Mississippi Valley and the Rocky Mountains, will mark an era in the history of the nearer of the mining Territories—Colorado. It will infuse new life into mining, by giving safe, quick, and reliable communication, reducing freights and risks, thus cheapening supplies and furnishing a most necessary competition in the labor market, under which the production of the precious metals will be largely increased, and the value and importance of property of all kinds will be proportionally enhanced. This cannot fail to arrest the attention of capitalists who are interested in Colorado gold and silver stocks, or are thinking of becoming so. It will be of yet more benefit to that large class whose capital is their muscle, because it will make accessible to them a new and large tract of virgin land, which, though far West, is still on the World's great highway, and therefore in no sense of the word in the backwoods. This region has a pleasant and healthy climate, and while its soil is unsurpassed in strength by that of the prairie States, it has a superior market in the adjoining mines. It most eloquently invites settlement and improvement. It will also give the Summer tourist a choice between the West and the East. It is not hazarding much to say that the Rocky Mountains offer the most delightful Summer resort of the New if not of the Old World. The climate is cool and bracing, the air deliciously pure and soft, the scenery both grand and beautiful, the forests full of game and the streams of trout, with hot mineral springs of high medicinal value boiling up at the root of every shade tree in the sequestered parks. The annexation of the Rocky Mountains to the Union by railways will open a new world to science, a new field of adventure to money and muscle, a new and pleasant place of Summer resort to people of leisure.

To meet the growing want of definite information concerning that interesting country, this book is put forth. It treats of the discovery of gold and settlement of the country, its geography, chorography, geology mineralogy, and agriculture, its early efforts at self government, and the progress and present condition of mining industry, including descriptive list of mining companies, principal improved mines, mills, machinery, and methods of treating ore—in short, it undertakes to give, as concisely and precisely as possible, and without any pretension, all that is known on the subject.

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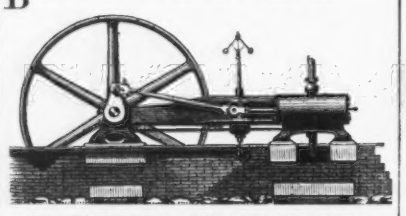

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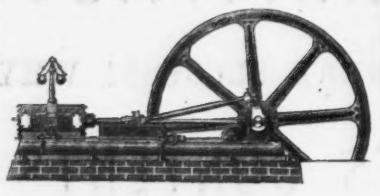

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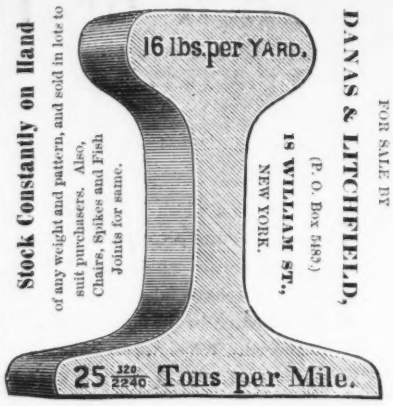
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